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ABSTRACT

The process described in this manual is designed to help small academic libraries systematically study the use of their circulating book collections. Originally developed in 1980, the manual has been used successfully in several small college libraries, both with and without assistance from outside consultants. In most cases, the study can be completed within 3 to 6 months with a comparatively small investment in staff training and supervision. After the preliminary steps of reviewing relevant information and deciding that the study should be conducted, the process consists of these stages: (1) deciding whether the library can carry out the study methodology on its own or if it requires assistance from other campus or external sources; (2) selecting the faculty and staff advisory group; (3) deciding on the appropriate data collection method; (4) training the data collectors; (5) collecting the data; (6) compiling, analyzing, and interpreting the data; (7) reviewing the results with the advisory group and other faculty and staff members; (8) developing recommendations for applying the results; and (9) implementing the resulting recommendations. A case study of the Lake Forest College survey experience, a four-page, selective bibliography, and a data collection and analysis guide with the necessary forms and sample data analyses are included. (THC)

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Measuring the Book Circulation Use of a Small Academic Library Collection: A Manual

October 1985

Office of Management Studies
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Washington, D.C.

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Measuring the Book Circulation Use of a Small Academic Library Collection: A Manual

October 1985

Prepared by Mary Kane Trochim
with
Arthur Miller, Jr. and
William M.K. Trochim

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Prepared by:
Mary Kane Trochim
with
Arthur Miller, Jr.
and
William M. K. Trochim

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A NOTE ON THIS PUBLICATION

In 1980 the Council on Library Resources provided a grant to the Associated Colleges of the Midwest to develop and test a procedure for measuring book circulation use. The authors developed the procedure outlined in this manual and tested it at the libraries at Lake Forest College, St. Olaf College and Knox College during 1981.

The draft manual which resulted from that project was then tested at four member libraries of the Cooperative College Library Center in Atlanta. The work at these libraries (Tuskegee Institute, Dillard University, Atlanta College of Art, and Tougaloo College) was supported by a grant to the Office of Management Studies (OMS) from the Council on Library Resources and focused on identifying needed additions and changes to the manual and developing a greater understanding of the potential uses of the data. This project was carried out by Mary Kane Trochim and myself, working with Hillis Davis, Director of the Cooperative College Library Center, and with directors and staff at the four test libraries. The project led to final revisions of the manual made by Arthur Miller and Mary Kane Trochim.

This manual is intended to provide sufficient instructions for a library to carry out a book circulation use study with no, or minimal, outside assistance. It is also intended to assist in interpreting results and turning them into productive changes in the library's collection management process.

We are appreciative of the contribution to this manual made by the staffs at the test libraries, particularly: Carole Taylor at Dillard University, Virgie Brocks-Shedd at Tougaloo College, Annie King at Tuskegee Institute, and Jo Anne Paschall at the Atlanta College of Art. Hillis Davis helped immeasurably in the design and operation of the tests.

Jeffrey J. Gardner, Associate
ARL Office of Management Studies
September 1985

PREFACE

This manual has been designed to popularize among small academic libraries and to put into "cookbook form" book collection use study methodology from the 1960's and 1970's. Following the 1980 Council on Library Resources-funded ACM book collection use study, this manual was distributed in preliminary form. Since then, the Council has funded a follow-up study through the Office of Management Studies (OMS). Some libraries have used the manual as a component of OMS's Planning Program for Small Academic Libraries; the manual has been included in the curriculum of at least one library school course on research, and the manual has been widely distributed and discussed in forums and professional meetings. It would no doubt be exaggerating to refer to it as an "underground classic", but its impact has been significantly broad prior to this publication.

The manual presented here essentially is the work of Mary K. Trochim, the ACM Study Project Manager in 1980 and a member of the OMS team with Jeffrey Gardner for the Council-funded follow-up study. In preparing the manual, Ms. Trochim drew on William Trochim's research methodology background as well as Mr. Gardner's process orientation and experience in writing self-study manuals. Since 1980 the manual has been used in some libraries without outside assistance, with the data being analyzed both manually and by computer. Other libraries have indicated they would have welcomed more explanation of various steps in the manual. I would suggest that librarians using this manual for the first time make the same preliminary decision as do librarians who are coming to grips with a new computer system: some--due to experience or inclination--pick up the manual for "Appleworks", for example, or "BRS After Dark", and accept the challenge of mastering the new "beast" on their own. Others (such as myself) prefer to have a colleague familiarize him or herself with its mysteries before introducing them to a wider staff audience.

This manual is a cookbook, written primarily for the former kind of librarian--and these are often, quite often, found in small academic libraries. As for the rest of us, we may seek some assistance--formally or informally, via a consultant or a friendly colleague--to help us with the study.

In 1985 many small academic libraries face pressures that call for new perspectives and tools in meeting their service and educational goals. For some survival is an issue; a recent major topic of the ALA/ACRL College Section Board has been the work of its committee on closing college libraries. Title IIA funding is history in Reagan's second term, and the demographic realities of college enrollments crunch inexorably on. Other college libraries, while not facing closing, face erosion of quality as funds get tighter, real acquisitions dollars shrink, and new priorities appear (microcomputers, for example). As automated systems start to show up in college libraries, they may be justified as much by their ability to provide management information (use data) as by their ability to replace student assistants typing overdue notices or drawers of time-tested 3" x 5" cards. Applied appropriately, use data can get at the "big ticket" issues such as energy and construction costs and those hotly-contested acquisitions dollars.

This manual has been applied, studied, adapted, and used as a jumping-off point for other work. I hope this reissue for a wider audience enables it to be even more useful.

Arthur Miller
Lake Forest, Illinois
September, 1985

INTRODUCTION

The process described in this manual is designed to help small academic libraries systematically study the use of their circulating book collections. Since the manual was originally developed in 1980, it has been used successfully in several small college situations, both with and without assistance from outside consultants. The procedures outlined can lead to information about a library collection which can help faculty and librarians in making fundamental collection development decisions and, in so doing, suggest more efficient use of a college's resources. The resulting profile of the use library materials receive can supply important information to indicate and support budget allocation decisions, selection and storage priorities, and space and facilities planning. Other results of the study may be to increase awareness and appreciation on the part of the faculty and other users of the collection's strengths and foster a climate of shared responsibility between librarians and faculty for maintaining its quality.

In most cases, the study can be completed within three to six months with a comparatively small investment in staff training and supervision. Experience has shown that some libraries can complete the study process using the manual with little or no assistance from outside consultants. Other libraries have found it valuable to have guidance from a person with some background in library or related research methods. After the preliminary steps of reviewing relevant information and deciding that this study should be conducted, the process consists of these stages:

1) Deciding whether the library can carry out the study methodology on its own or if it requires assistance from other campus or external sources.

2) Selecting the faculty and staff Advisory Group.

3) Deciding on the appropriate data collection method.

4) Training the data collectors.

5) Collecting the data.

6) Compiling, analyzing, and interpreting the data.

7) Reviewing the results with the Advisory Group and other faculty and staff members.

8) Developing recommendations for applying the results.

9) Implementing the resulting recommendations.

It should be noted that the procedures for data collection and analysis described in this manual can be applied at any small library without establishing the more formal climate mentioned above and described in Chapter II; a library director may merely want a status report on the collection's holdings and use, or may want to use the results of the study to aid in some other library process such as installing a theft detection system or conducting a retrospective conversion. Although the manual is written with the more formal implementation of the study in mind, procedures for carrying out the "short version" are also identified.

This manual will raise questions and provide answers about the study: where the idea began, what research has indicated about circulation use studies, what the premises are; why and how a library might decide to do the study, what the costs are (in terms of time for organization, training and implementation, supplies and data analysis), and what some likely benefits are. It will provide procedures for the staff to follow at each step in the process.

With the support and interest of librarians and faculty, the study will yield information which can be used, with other considerations, to affect the character of a library's collection in positive ways.

BACKGROUND

Small private colleges are an important and distinctive part of higher education. They provide a climate which expands the types of higher education available to fill the needs and preferences of all types of students. The strength of small academic libraries was particularly noticeable in the 1960's, when the flexibility permitted by a small community provided a healthy climate for experimentation in curriculum offerings and other programs of a liberal arts education. The libraries of smaller institutions have, until about 15 years ago, been somewhat autonomous in the way they served their clientele. The holdings of the library were gathered to serve the needs, as much as possible, of all the faculty and students on the campus.

All this has changed. The smaller private institution is no longer able to perform autonomously, and the library is under the same kinds of restrictions. The years that separate us from the boom of the 1960's have had a visible impact on small educational institutions and their libraries.

Necessity, once again, is the mother of invention. Creative solutions to the problems of limited resources have been proposed and carried out by college administrations; libraries of these small colleges have also met the challenge of providing more exact and specialized service for their users while operating in a climate of austerity.

Reciprocal collection arrangements among libraries of the same type or the same region, shared staffing among libraries in the same location, computerization of some library functions, and the increased use of information databases are all committed responses to the situation in which smaller academic libraries find themselves.

Smaller academic libraries also have had to look even more carefully at their internal processes. Few library budgets have been able to keep up with the rising cost of materials, and since the volume of desirable items continues to increase with the information explosion, libraries find that they can purchase an even smaller portion of appropriate materials. One way of balancing the needs of users and the rising cost of maintaining a library is to conduct a collection use study.

Several studies of this type have been conducted in the past by Trueswell, Jain, Fussler, and Simon, among others. (The manual's bibliography lists reports of these and other studies.) The studies have indicated that a relatively small portion of the existing collection in a library can satisfy most of the information or research needs of its users. The late Richard Trueswell observed in the 1960's that, in general, about 20% of a university library collection will meet 80% of the demand on that collection. Trueswell used a book's last circulation date as a predictor of how likely it was that the book would circulate again soon. By and large, the books that have circulated recently are those most likely to be checked out in the near future. Books that have been some years without circulating are much less likely, on a percentage basis, to circulate in the coming few terms. Trueswell's studies at Northwestern, Mt. Holyoke, and elsewhere demonstrated the general library relevance of this finding. The 1980 ACM study accepted these findings and set out to develop a model for conducting such studies in college libraries. In the process, the data from the three colleges reaffirmed the findings, though the ratio shifted toward 40/80 vs. 20/80. With the additional component of resource sharing among libraries in the same area or of the same type, the findings argue against building a small college library collection based upon quantity alone; there is no certainty that a collection of 200,000 volumes is twice as effective as a collection of 100,000 if the larger collection has a large proportion of materials which are obsolete or inappropriate.

In addition, the expense of housing and maintaining an ever-expanding collection has forced many libraries to consider anew the concept of a steady-state library--a collection whose size remains fairly stable, with annual withdrawals of obsolete and unused materials balancing the annual additions. This concept, first greeted with horror by the librarians of small

academic institutions, has become accepted as a realistic response to economic structures. Many librarians see that a steady-state library can not only live within existing physical facilities but may also prove to be a more effective agency to serve the undergraduate student and small college faculty than an expansionist library.

Reliable information about the actual use of selected materials is crucial to this concept to aid in both materials selection and the evaluation and weeding of an existing collection.

It must be made clear, however, that this information about use, necessarily quantitative, is simply one kind of information which will be used with other more qualitative considerations. Use information should never be considered as a sole criterion for selecting or keeping material for a collection. It is important that the results of a use study be interpreted carefully by librarians and teachers working together, applying their varied knowledge about materials and their use. For example, the discovery that some materials receive relatively little use may prompt an adjustment of the curriculum or teaching procedures, including bibliographic instruction, and thereby stimulate use. Furthermore, it is evident that materials in certain disciplines are used more frequently within the library, so that information about their circulation has relevance only when combined with other sources of information.

THE ACM LIBRARY COLLECTION USE STUDY

The librarians of the Associated Colleges of the Midwest (ACM) became interested in the concept of honing their collections to fit more accurately the needs of their clientele and the resources of their institutions prior to a 1975 ACM conference on libraries, growth and space. At that meeting, Richard Trueswell presented the results of circulation studies that he had conducted at other academic libraries. Several ACM librarians decided at that time to conduct use studies at their libraries. Shortly thereafter, a pilot study was designed to test three different methods of data collection in three ACM libraries in order to recommend specific procedures for use at other libraries. This project, which was funded by the Council on Library Resources, Inc. in 1980, was carried out at three ACM libraries (Knox College, Lake Forest College, and St. Olaf College) to develop a profile of the use of each college's collection. In addition to supplying the test libraries with information about their own collections, the study also proposed to document the cost of collecting the data, test various methods of gathering the information to measure their effects on regular library routines, develop data analysis routines for easy application at other institutions, compare the usefulness of different sample size results, compare the findings in three colleges, and compare the results of this process with other library use studies.

Thanks to the cooperation of the librarians and staff at the test libraries, the results of the pilot study provided even more useful information than had been anticipated. In addition to creating a profile of

each library's collection by subject area, age and use, the results also compared favorably with the findings of previous studies at different types of institutions and pointed to specific data collection and analysis methods which can be recommended over others. It was also confirmed that such a study can be done without putting financial stress on a library's budget or emotional stress on its staff. One of the most significant findings for the purposes of this manual is the discovery that a smaller sample than those taken during the pilot study can yield similar information, generalizable to the whole circulating collection.

In general, the 1980 pilot study permitted a testing of methods and sample sizes which had not been undertaken before, and supplied the information necessary to make this manual a pertinent and practical tool for determining the use of a library's circulating collection.

Since 1980, the Council on Library Resources has funded a follow-up study at the ARL Office of Management Studies, working with four small academic libraries (Tuskegee Institute, Dillard University, Tougaloo College, and Atlanta College of Art). Other colleges have used the study methodology as part of the OMS's Planning Program for Small Academic Libraries.

THE LIBRARY'S ROLE ON CAMPUS

The library is a partner in the institution's efforts to define its academic goals and priorities and also to met them. As competition for academic excellence and financial stability increases among academic institutions, the library's ability to maintain quality within narrowing financial parameters will be viewed with appreciation by the college's administration and faculty. A library which actively shares in the institution's decisions and which seeks creative ways to further the goals of the college will likely have the support of the other segments of the campus structure in undertaking a study like the one outlined here.

When the feasibility and potential usefulness of this study are discussed, outcomes and decisions which will affect the way a library is perceived by other campus units, such as academic departments or financial offices, will undoubtedly arise. It might be wise to consder what these outcomes might be, and plan to build these into the library's existing relationship with other segments of the college structure. Some considerations might include:

- The current financial climate at the college, and how this affects the library's budget and programs
- Current faculty and student expectations regarding library programs and services
- The decision-making structure within the college.

All of these considerations have to do with the relationship of the library to other campus units and other constitutencies. Although situations will vary, the way in which the administration, faculty and library communicate priorities and decisions will affect both the way the study is carried out and the climate for acceptance of its results.

CHAPTER I: INITIATING THE STUDY

This section of the manual offers suggestions to help librarians decide about the value and feasibility of conducting this project. Some of the questions that will doubtless arise are stated here, and the responses given are based upon the experiences of the pilot libraries.

WHY SHOULD A LIBRARY CONDUCT THIS STUDY?

Previous research in all types of libraries has shown that a relatively small percentage of a library's collection can fill a great majority of the library's circulation demand, and that a very strong relationship exists between the age of the material in a particular field and the demonstrated need for that material. The pilot study upon which this manual is based bore out these conclusions. While all use studies agree regarding these general findings, it is obviously very useful for librarians to have precise reflections of their own collection's use. Depending upon the data collection method or methods chosen, the results of the study may include the following information:

- The number of circulating volumes in the library
- A profile of the collection: i.e., percentages of holdings in each discipline
- A profile of the age of the collection within each discipline
- A comparison between the age and use of the materials in each area
- A profile of current use by discipline
- An identification of the portions of the collection which are underused, and those which are used more than their size would indicate.

Some librarians may want a tool to provide them informally with information about the way their collections are used, so that internal decisions can be facilitated. Others may see this study as an opportunity to draw attention to the library's quality and performance through a more formal and public implementation of the study. This manual addresses the latter audience in the procedures it recommends, but library directors with a less

formal framework for the study can apply only the data collection and analysis procedures to get information on their collections' uses for informal internal applications.

HOW CAN THIS INFORMATION BE USED?

The results of the study can help librarians and faculty in making some basis collection development decisions; they can also provide valuable information for librarians contemplating program or facilities changes.

Collection Development

The results may suggest activities such as selecting a core collection of heavily-used items, purchasing of duplicate copies, allocating funds for materials purchase (using the results as one consideration), testing the efficiency of the acquisitions process over time, or weeding or moving to less-than-prime shelf space the materials which receive comparatively little use.

Program Changes

Based upon the results of the study, librarians and faculty may consider library instruction in the use of certain classes of materials, may propose the inclusion of quality material which is under-used in the curriculum's recommended reading, and may suggest changes in reference and bibliographic instruction staffing, based upon the use patterns developed during the study.

Facilities Changes

The results of the study can help a library's staff pinpoint the most heavily-used portion of the collection; this can cut significantly the cost of preparing the collection for an automatic book detection system, of reclassifying the collection from, for example, Dewey to LC, or of converting the shelflist into machine-readable form for entry into an automated circulation data base. For librarians faced with the necessity for more space, the results can help indicate the kind of items most required by the library's users, and can suggest various levels of storage access for different kinds of materials.

More detailed examples of application are contained in Chapter IV which also inclues suggestions for reading the data to help make these and other judgments.

WHO SHOULD BE INVOLVED IN THIS STUDY, AND HOW?

Provided that the library staff wants to implement the study for campus-wide visibility and results, the importance of involving administration, faculty, library staff and students in the study cannot be overemphasized. An Advisory Group, which would include most of the following, should be established to plan and oversee the study:

Dean of Academic Affairs

This person can serve as a link between the faculty and the administration in interpreting the results of the study and making financial and other recommendations.

Faculty Members

Faculty library committee members, faculty members from several department or disciplines, faculty active in research and/or those with interdisciplinary interests should be included. There are several reasons for involving faculty members in the study:

- At a small college most library use closely reflects either the curriculum or the research interests of faculty members. Faculty awareness of the contents of the collection and how it is used can improve both types of uses.
- Awareness of the library's attempts to improve service will help faculty members when they, as members of college committees, consider institutional priorities.
- Some faculty members may have expertise which can facilitate the project; for example, a teacher of research design may help streamline the gathering or analysis of the data.
- Unless faculty members are involved in the study, they may have strong negative reactions which will make it difficult to use the findings of the study in a meaningful way.

The pilot study indicated that, where relationships between the faculty and the library were generally good, the interest of the faculty was high while their anxiety about possible negative effects was rather low. Involving faculty representatives in library projects is usually relatively simple in the small college since most faculty have a vested interest in the shape of the library collection and appreciate being asked their views on library-related matters.

Computer Center Staff

Involving computer center staff or faculty from the Computer Science Department serves several functions:

- It may help establish the credibility of the project on campus.
- It may provide a vital communication between the library and the computer center which could pave the way for future computer-assisted library applications.
- It may help the input and analysis run more smoothly.

Library Staff

While only one or two members of the library staff are likely to be directly involved in carrying out the study, it is important that all staff members be informed about it. Their opinions about its usefulness and feasibility can significantly affect every step of the process, and they may be able to suggest ways in which the study can be carried on with minimal effect on daily operations of the library.

Students

At most institutions, the data collection will be carried out by student assistants, and it is important that they be informed of the purposes of the study so that routine procedures can be perceived to have some meaning. Their participation also offers an opportunity to advance general student body understanding of the study, and to obtain student suggestions and questions.

HOW IS THE DATA COLLECTED?

Three different methods of collecting data about the circulating book collection were used in the pilot study, so that comparisons regarding ease and accuracy could be made. They are the circulation sample, the stack sample, and the shelflist sample.

The information collected by all three methods is the same: the call number, the publication year, and the last circulation date.

- The first two fields of the call number are the most important ones for the purposes of this study, since they provide adequate subject identification.
- The year of publication is collected for each item to indicate the approximate year of acquisition, since acquisition date is not always readily available.
- The last circulation date is an item whose definition and use are crucial to the study. Previous research by Trueswell and others has established the date of last circulation and its relation to date of publication as an accurate proxy for the frequency of use which a volume receives. This helps establish relative use of various items in the collection. More detailed explanations of this concept can be found in Trueswell's contribution to Farewell to Alexandria, and in the pilot study final report.

The circulation sample includes all monographs circulated over a given period of time, and is usually collected as the material is checked out. Call number and last circulation date are taken from the circulation record, and the publication year is collected from either the shelflist or card catalog record.

The circulation sample provides information about the items that circulate during the study periods, including a general profile of that population's previous use.

The stack sample is a systematic random sample of the circulated monographs on the shelves at the time of the study, and is the simplest process to implement. If the sample size if 4%, for example, one of the first 25 volumes on the shelf is chosen randomly, and every 25th volume thereafter is considered part of the sample. All three data items are collected from the actual volumes, unless a missing item necessitates checking the shelflist record.

The stack sample measures the collection (with some bias due to currently circulating items) in terms of age, previous use, and relative size of each section of the collection.

The shelflist sample is a systematic random sample of the items listed in the shelflist, and is conducted somewhat like the stack sample. The differences are that the shelflist data collection is from the information contained on the shelflist entry instead of the actual volumes, and the process includes the additional step of locating the sampled item in the stacks. Collecting the information through the shelflist sample takes approximately twice as long as the stack sample method, and can yield more information about the collection.

Each method presents a different methodological problem: the circulation sample favors that part of the collection currently in use, which reflects the curriculum; the stack sample favors items which are not in use during the study; and the shelflist sample favors items which are not part of multi-volume sets, for which one shelflist record would exist. Trueswell has used a combination of the circulation sample and the stack sample to arrive at estimates of collection use. The pilot study results indicate that these two can be combined to yield an abundance of collection information, but each method is independently useful, depending upon the questions being posed about the use of the circulating collection.

Chapters II and III provide more detailed information about choosing data collection methods, and the kinds of information each process can provide.

HOW MUCH DATA SHOULD BE COLLECTED?

During the pilot study, 4% samples were collected at each institution by both the stack sample method and the shelflist sample method. The circulation sample at each library was collected to equal as close to 4% of the library's collection as possible within the time frame of the study. Tests conducted on the results indicated that, although a larger sample is always preferable, as small a sample as 1% of the circulating collection can provide meaningful information about the collection's use, provided this is a numerically significant amount. One percent for a library of about 100,000 volumes would yield 1,000 items for study, while 1% of a 15,000 volume library would yield only 150 items, a very thin sample. Also, if a library is interested in determining the patterns of use of smaller areas of the collections, a larger

sample size is recommended so that these subareas are not under-represented in the resulting data. (See the table of sample sizes according to percent chosen and size of the collection in Chapter II.) If practical matters such as time and resources available are considerations in the decision on sample sizes, or if the study is being implemented on a rather informal basis, a smaller sample can yield reliable general information, depending on the total number of items involved.

WHAT WILL THE STUDY COST?

The major costs of the study are in the terms of staff time, outside advice or consulting (if any), supplies, and computer assistance (if available).

Managing the Study

If the study is conducted from in-house resources alone, it should be recognized that the major cost to the library will be in terms of the amount of time library staff will spend performing these tasks: communicating with the Advisory Group, training for and supervising the data collection, arranging for manual or computer-assisted data compilation and analysis, and presenting the findings in a usable form. Based upon the original pilot libraries' experiences, an estimate of 15 to 18 hours per week of professional staff time should be set aside for managing the study.

Collecting the Data

Student assistants and/or permanent staff members may be scheduled to collect the data. The length of time required will vary, depending upon the sample size and method(s) chosen. This part of the project is an intensive short-term process; scheduling as many hours as possible for a short period of time is preferable to spreading this phase of the study out over the length of a term, for example. An alternative to this is conducting a circulation sample by choosing days at random from the entire academic calendar.

Other Activities

Other activities will require some staff time including communicating about the study to the campus population in general, proposing ways of putting the results to use and acting upon these suggestions. In most cases, these activities will fall to the library director, usually with some assistance from the staff.

A general outline of the study's requirements of time follows in the next section.

Supplies

The items needed to do the study are few, and will usually be available through regular supplies budget lines at most small academic libraries.

Data Collection Sheets, Logs and Analysis Sheets

The number needed can be estimated according to the size of the sample and the number of data collector shifts. This is described in Chapter II.

Photocopying

Photocopying for reports and for Advisory Group communications will also be required.

Other Supplies

Incidental supplies, such as binders and pencils, will likely be available through the regular budget as the need arises.

Computer Assistance

It is not necessary to rely on computer assisted data analysis for this study to have meaningful results. But if a computer center staff person or other computer expert is available, he or she can provide assistance in streamlining the study process, such as:

- Producing the data collection and analysis sheets
- Inputting the data
- Analyzing the data
- Producing printouts of the results

Based on the pilot study, a cost of about 2¢ per line of data can be estimated for processing only. If, for example, the data collection equals 4,500 items the cost of processing will be about $90.00.

Data input is a major computer cost; it was found to be approximately 17¢ per line entry for the pilot study input, based on a rate of $10 per hour. Libraries on smaller campuses can often make use of study assistant time for tasks like this; additional cost, then, is minimal. In addition to computer time, it is important to keep in mind that the computer center may also charge for staff or programming time spent on the project.

HOW LONG WILL THE STUDY TAKE?

The pilot study's results show that the project often can be carried out in about three months without overburdening the library staff or Advisory Group. The variables are many, of course, resulting in a longer period of time; they include the size of the sample, staff experience with data or statistics, the number of data collectors, the data collection procedures chosen, the kind of data handling process chosen, and the degree of detail desired by the Advisory Group and interested faculty members. A study of the stacks or shelflist can be most conveniently done during academic breaks,

whereas a circulation sample must be carried out during a period of regular activity. The Project Activities List and the Comparison of Data Collection Methods can help estimate the amount of time required to carry out the project in a particular library.

WHO SHOULD STAFF THE STUDY?

One or two member of the library's public services staff will likely be in charge of the project. They may oversee the operation, with assistance from others at some point. Each of the pilot libraries chose to staff the project differently, and all were successfully carried out. Specific suggestions for staffing are mentioned later, in Chapter II.

WHAT SPECIAL EXPERTISE MAY BE NEEDED DURING THE PROJECT?

The ability to adapt the general procedures and advice contained in this manual to local circumstances is a special type of expertise which will prove very useful. Other kinds of expertise which can make the study easier and more relevant:

- A knowledge of the collection's subareas
- Knowledge about research methods and manual data processing
- Familiarity with the institution's computer facilities (if any) and capabilities
- Ability to communicate the goals and results of the study to the campus community

The library director and faculty representatives will be likely responsible for the first and last items; including a Computer Center representative as an Advisory Group member will help ensure the third.

WHAT ARE THE MAJOR STEPS IN THE STUDY?

The Project Activities List states the procedures for carrying out the study. They are basically three: preparation, implementation, and followup

- Preparation includes planning by the library director and staff to present the study to the faculty and administration, obtaining their interest and approval, consulting with on-campus experts who might offer assistance, proposing a study timetable, and making the necessary staffing arrangements.
- Implementation consists of training for the data collection and carrying it out, putting the information into analyzable form, performing either manual or computer-assisted analysis, and discussing the results in light of local circumstances.
- Followup designates the processes of recommendations based on the study's results and steps to put recommendations into practice.

HOW WILL THE DATA BE TURNED INTO USABLE INFORMATION?

The Data Collection and Analysis Guide and Chapter III provide instruction for analyzing the information manually. The Lake Forest Case Study illustrates the application of simple computer programs written in commonly used statistical software packages like the Statistical Package for the Social Sciences (SPSS), BMDP, SAS, and Datatext for the same purpose. The procedures, whether conducted manually or with computer assistance, are the same.

For each of the variables, or items of data collected, three types of analysis can be performed:

- Frequency distribution; the number of items that fit the category being examined
- Cumulative frequency distribution; the accumulation of the totals in the category under examination
- Cross tabulations; the pairing of two items of information for comparisons.

These three types of analysis can be applied to large sections of the gathered data, or may be used to supply information about specific subareas of the collection.

The analyses will provide a basic description of the collection and its use. The five analyses described in the Guide must be computed separately for each subject area of interest; for example, a library may conduct a stack sample and a circulation sample, and may define 23 subject areas of interest. For a complete analysis one would compute the following:

	Number
Five analyses for all data from the circulation sample	5
Five analyses for each subject (5 x 23) within the circulation sample	115
Five analyses for all data from the stack sample	5
Five analyses for each subject within the stack sample	115
Total analyses for both samples	240

The complete analysis would generate 240 separate tables!

Obviously this task would require considerable effort. If the amount of work is prohibitive, the library staff, together with the Advisory Group, should consider the goals of the study and recommend that only the analyses needed to reach these goals be carried out first. The data will always be available for complete analysis when this becomes feasible.

Combinations of ways to view the data collected are limited only by the time and resources available and the creativity of the person in charge. Some are outlined in this manual; others will suggest themselves as the Advisory Group and library staff discuss possible results and their application.

CHAPTER II: PREPARATION

It may be difficult for the staff of a small academic library to envision their own successful implementation of a study of its collection. Indeed, most previous projects which attempt to define collection use have taken place in large research institutions where funding and expertise were available, or under the direction of outside consultants, or both. But recent experience (including the pilot study upon which this project is based) has shown that smaller academic libraries can conduct research relevant to their circumstances without the assistance of usually costly outside consultation.

Recent technical advances upon which the library can draw, when applied by staff members who are interested in finding practical ways of improving the library's image and performance, make such a study feasible.

The procedures outlined in this chapter are suggestions based upon the experiences of the three pilot libraries. They are as specific as possible, given the almost infinitely varied population of smaller academic libraries. The library staff should feel free to alter the procedures to fit local circumstances; they can also be carried out within a less stringent time frame, if calendar strictures are not a major consideration.

Although the following instructions outline the full study process, including involvement of faculty at the outset and the proposal of recommendations for action at the conclusion, the basic data collection and analysis routines can be carried out in a very informal manner by library staff members seeking information for inclusion in reports for internal processes. These tasks are the same regardless of the ways in which the information will be applied.

The general procedures are outlined on the Project Activity List

[INSERT PROJECT ACTIVITIES HERE]

and can be described as three stages: preparation, implementation, and followup.

PROJECT ACTIVITIES

Calendar	Activity	Personnel	Time
Week 1	Read manual and supporting information	Library Director Staff	2 Days
	Discuss study implementation	Library Director Staff	2 Days
	Identify Project Supervisor		
Week 2	Meet with Academic Dean	Library Director, Academic Dean, Project Supervisor	1 Day
	Contact possible candidates for Advisory Group	Library Director, Academic Dean, Project Supervisor	3 Days
	Publicize study on campus	Library Director Project Supervisor	2 Days
Week 3	Set up Advisory Group & hold first meeting	Library Director, Project Supervisor, Advisory Group	3 Days
	Choose data collection procedures Choose sample size	Project Supervisor, Other Library Staff	2 Days
Week 4	Choose data collectors Prepare materials, train data collectors	Project Supervisor Data Collectors	2 Days
	Choose Data Analysis Procedures	Project Supervisor	1 Day
Week 4-6	Collect data	Project Supervisor Data Collectors	3 Weeks

Calendar	Activity	Personnel	Time
Week 6	Report to Advisory Group, Progress Report to campus community	Project Supervisor	1 Day
Week 7	Compile and analyze data	Project Supervisor, Data Collectors, Student Assistants or Computer Center Staff	2 Weeks
Week 9	Prepare report on findings	Library Director, Project Supervisor	1 Week
Week 9-10	Meet with Advisory Group, review possible applications	Project Supervisor, Library Director, Advisory Group, Other Library Staff, Academic Dean	1 Week
Week 11	Present to faculty for discussion	Library Director, Advisory Group, Project Supervisor	1 Week
Week 13	Implement recommendations	Library Director, Faculty, Administration	

READ MANUAL AND SUPPORTING INFORMATION

The library director should urge the staff to review the manual with the idea of actually carrying out the study. Supporting information, such as accounts of prior research in this area and suggestions for analysis and application, are listed in the manual bibliography.

DISCUSS STUDY IMPLEMENTATION

After reviewing the manual and other information, the library staff should discuss the study's feasibility and desirability, and make suggestions about:

- How the use study will affect regular library procedures
- What useful information the study is likely to yield
- The availability of a qualified staff member's time to supervise the project
- Other costs which the study may require
- How long the process is likely to take
- What staffing patterns for data collection are possible
- What faculty members are likely to show interest in the results
- How to inform the campus community of the project
- How the data collection and analysis will be conducted.

IDENTIFY PROJECT SUPERVISOR

The position of the staff member designated as project supervisor will vary, of course, given the size of the staff, the time of year in which the study is to be done, the interest and experience of various staff members, and many other factors. A list of likely candidates may include:

- Readers' services librarian or assistant
- Circulation services supervisor
- Student personnel supervisor
- Technical services librarian or assistant

The staff member chosen as project supervisor will need occasional support and assistance from others on the staff, such as advice regarding the data collection routines, or help in solving scheduling problems. Other staff members who can assist during the various stages of the study should be identified at this time.

Duties

The project supervisor is the person mainly responsible for coordinating the various aspects of the study. These include:

- With the library director, notifying the Advisory Group and other campus members about the study
- Providing background information for interested parties

- Discussion with library staff and Advisory Group members regarding possible uses of the results, and ensuring that these interests are reflected in the process and results
- Choosing, training, and scheduling the data collectors
- Supervising the data collection
- Conducting periodic accuracy checks on the collection routines
- Devising ways of applying the manual's suggestions to the local situation
- Enlisting the aid of the Advisory Group and other groups on campus to publicize the study
- Supervising the compilation and analysis of the data
- Preparing a report on the study's results
- With the library director, proposing possible actions indicated by the study to the campus at large.

MEET WITH ACADEMIC DEAN

The importance of presenting the study to the administration for approval is obvious. The library director and the project supervisor should have a fairly defined schedule for the study at this time. The items which should be considered prior to the library director's discussion with the Academic Dean are:

- Role of the project supervisor
- Suggestions for Advisory Group members
- Approximate dates of the study
- Estimate of weekly activities
- Chosen data collection and analysis procedures
- Proposed staffing for data collection
- Estimate of cost.

The Academic Dean's interest and support can help significantly when presenting the project to the faculty. He or she also may be able to suggest likely faculty members for inclusion on the Advisory Group.

ORGANIZE ADVISORY GROUP

With the assistance of the Academic Dean, the library director and project supervisor should decide upon the number of campus community members to be included on the Advisory Board. Keeping in mind the breadth and variety of interest in the library on campus, the project supervisor should list the specific functions of the Advisory Group, the types of interest and expertise which would help the Advisory Group fulfill its functions, and the people on campus who have these interests.

Functions

The functions of the Advisory Group are:

- To familiarize themselves with the purposes of the study
- To approve the application of the study process

- To present reports on the study's progress to other members of the campus community
- To advise the project supervisor during the course of the study
- To facilitate the data collection and analysis processes where necessary or possible
- To discuss the results of the study with the campus community at large
- To formulate recommendations based upon the study's results
- To assist in the implementation of these recommendations.

Representation

Interests or expertise which may be usefully represented

- Faculty-library committee membership
- Familiarity with administrative committee work
- Interdisciplinary research and teaching interests
- Heavy course-related library use
- Significant library use for personal research
- Computer expertise
- Research design or methodology expertise.

People on campus whose interests are reflected above may include:

- Academic Dean or assistant
- Interdisciplinary faculty, e.g., philosophy/language, theater/music
- Representatives of varied disciplines whose library-related work is signficant
- Faculty or honors students conducting a research project which requires heavy dependence on library resources
- Computer center staff, or student of computer science.

The project supervisor or the library director will contact the people who, based upon the above criteria and upon the opinion of the staff and Academic Dean, would bring interest and knowledge to the Advisory Group to help it fulfill its role.

It will be necessary to explain the study process and purpose to these people; a brief written description would probably be helpful.

Size

The size of the Advisory Group is at the discretion of the study planners; it is important to balance the desire to include all interests with the necessity to keep the group a manageable size, considering the size of the institution and the duration of the study.

PUBLICIZE THE STUDY

Having chosen the members of the Advisory Group, the project planners (usually the library director and the project supervisor) should ask the group's assistance to communicate information about the study to their colleagues and to the campus population in general. In addition to informal discussions among faculty and staff members, these methods can be used to publicize the study on campus:

- Departmental meetings at which the project supervisor or a resident member of the Advisory Group can discuss the study
- Formal faculty meetings at which the library director or other involved persons can describe the project
- Administration staff meeting at which the dean can report on the library's plans
- A library news release to all faculty
- Signs and posters in the library.

HOLD FIRST ADVISORY GROUP MEETING

The Advisory Group's function can be as formal or informal as desired, and the tone will likely be set at the first meeting. The library director may want to attend this meeting; the project supervisor will probably present the study procedures and results for discussion, and should be prepared to answer questions about the possible ways results can be applied. Chapter IV can provide some examples.

Discussion of the members' concerns and opinions should be actively encouraged, because eventual agreement about the outcome will be directly related to early awareness and understanding of the study's purpose.

CHOOSE DATA COLLECTION PROCEDURES

As mentioned in the introduction, the pilot study tested a circulation sample method, a stack sample method, and a shelflist sample method for ease of data collection and usefulness of results. All three are easy to implement, and all three yield accurate and pertinent information about a library's collection. Each has its own biases and practical difficulties, and each can provide different results. A brief comparison of the three methods appears later in this section. Chapter IV contains more suggestions for using the data and how to interpret it.

The Circulation Sample

This method of data collection differs from the other two in several ways:

- The data collected is a sample over time, not a systematic sample.
- The time in which the data is collected has more of an effect on the results than in the other samples.

- The method measures the characteristics of currently used materials, which can not always be generalized to the entire collection.
- The data collection is most useful when conducted on sample days chosen from a longer period of time.
- The data collection procedures usually can be built into other circulation desk routines; this slows checkout or statistics-gathering procedures, but obviates the necessity for special data collection staff.

Data from the circulation sample can reveal several items of interest:

- It can help identify currently used sections for a library reclassifying its collection, so that the most heavily used areas can be reclassified earlier in the process.
- It can serve the same kind of function for a library installing an electronic theft detection system, in which heavily used materials should be flagged before little-used sections.
- It can indicate areas where purchase of duplicates might be considered.

The Stack Sample

This is the easiest method to implement, for several reasons:

- All of the necessary information can be taken directly from the volumes sampled, in most cases.
- The method requires little preparation.
- Multi-volume sets are adequately represented in the sample, since the volume is the sample unit.

A drawback of this method is that it is biased against currently circulating materials, but the pilot study indicated that this is less significant than first expected.

The stack sample results can be applied to several circumstances:

- By defining the contents of the collection and comparing their last circulation dates in general, bibliographic instruction can be tailored to reflect the collection and to foster use of underused sections.
- Identifying materials to weed or move to less accessible shelf space can be aided with the stack sample results, if a certain number of volumes must be moved.
- A "core collection" made up of a specified number of volumes can be established by choosing the sections with the most recent last circulation dates.

Shelflist Sample

The shelflist sample is similar to the stack sample in both method and results, with a few important differences:

- This method takes twice as long to collect, since it is a two-step process.
- It requires searching the shelflist in a systematic way, which, even if pains are taken to correct for it, under-represents the multi-volume series and over-represents items whose shelflist entries are longer than one catalog card.
- The pilot indicated that the shelflist sample results underestimated the total size of the population, even though similar percentages for sections of the collection were found in the stack and shalflist samples.

Expectations during the pilot study that the shelflist sample would yield the most accurate information proved to be unwarranted. The shelflist sample results can be used for the same purposes as those of the stack sample. In addition, if information about the book's location is recorded, an indication of the number of currently used or missing items can result.

Circulation/Stack Sample

The combination of information derived from the circulation sample and the stack smaple together is more than the sum of its parts. In addition to the uses to which both sets of data can put individually, the data from the two methods can be combined to compare the collection in general to the kinds of materials which are currently used. Some application of this colection use profile may include:

- Identification of those fields whose collections are comparable with use, those whose collections receive a greater amount of use than size would indicate, and those whose collections receive less use than size would indicate.
- Collection development based upon identification of areas where attention is warranted.
- Establishment of a core collection using criteria of both size and use.

Recommended Methods

Based upon the results of the pilot study and the experience of three library staffs implementing the three methods of data collection described above, it is recommended that a library implement the combination/stack sample method, since the quantity and kind of data yielded would be invaluable for

suggesting and supporting appropriate policy and program changes. A library should conduct a combination sample study if:

- o There is adequate time to supervise and carry out both.
- o Sufficient staff time is available.
- o The library staff and Advisory Group want the maximum amount of information possible about the collections' circulation and use.

Chapter IV details these and other uses for the study data, and describes how to interpret the information.

The next best data collection method is the stack sample alone. A stack sample yields a usable collection and use profile over time and is the easiest to carry out. A library should conduct a stack sample if:

- o Staffing is not available for both kinds of data collection.
- o The library staff feels they can generalize from the data of the stack sample about previous circulation patterns.
- o Time limits exist for carrying out the study.
- o The results are to be used mainly for internal decision-making (although the results of the stack sample also can be presented confidently to support library program and policy decisions).

Although the shelflist sample is not recommended because of its lengthy data collection schedule, it can be done in combination with the circulation sample if library staff are interested in determining the percent and type of materials checked out and/or missing at a given time. This can be done if a library can staff the extra data collection and supervision hours without taxing the current staffing situation.

[INSERT "COMPARISON OF DATA COLLECTION METHODS" HERE]

CHOOSE SAMPLE SIZE

Choosing the size of the sample is a complex process influenced by many factors, such as:

- o The amount of time and resources available.
- o The level of accuracy required.
- o The number of subdivisions of the collection which will be measured, and their size.

Taking as large a sample as possible makes sense intuitively, since the amount of uncertainty decreases as the amount of information increases. The pilot study's sample sizes were set at 4% for stack and shelflist methods and a quantity approximately equalling 4% for the circulation sample. This was found to be sufficient for the test. However, tests of data which represented as little as 1% of the collection indicated results which were comparable to the 4% sample results for most applications. The Final Report of the ACM Library Collection Use Study contains a detailed report.

COMPARISON OF DATA COLLECTION METHODS

	Circulation	Stack	Shelflist	Circulation and Stack
Time Required	100 items per person hour (1 person each 100 items)	100 items per team hour (2 persons each 100 items)	100 items per team hour (4 persons each 100 items)	100 items per team or person hour (3 persons each 100 items)
Calendar Limitations	Must be collected during periods which reflect "typical" use times	Should be collected during low use	Should be collected during low use	Both collection periods are necessary
Recommended Staffing	Daily: one data collector	1 team of 2 data collectors	2 teams of 2 data collectors	3 data collectors
Procedures	1) Record data from circulation records 2) Record publication data from shelflist	1) Flag sample books 2) Record data from sample items	1) Flag sample shelflist cards 2) Record data from cards 3) Record LCD from books on sample items	Both circulation and stack samples
Results	Profile of current circulation by discipline, age, last circulation	Profile of collection by discipline, age, last circulation; use pattern over specified time period; number of circulating volumes held.	Same as stack sample, subject to accuracy of shelflist	Same as circulation and stack sample and measure of current circulation patterns in relation to total holdings by discipline, age
Types of Samples	Non-random or random sample over time	Systematic random sample	Systematic random sample	Same as circulation and stack sample

It is recommended that the sample collected be no less than 1% of the estimated circulatable collection size. A larger sample will be more advantageous when measuring subsections of the collection because it will more accurately represent subdivisions with fewer volumes. A larger sample will also help convey a more authoritative statement for discussion of the results and their application. A chart of sample size percentages by the number of circulatable volumes in a collection follows later in this chapter. It will be helpful in estimating the actual number of items to be sampled.

PREPARE MATERIALS FOR DATA COLLECTION

The items needed for data collection are the same, regardless of the method chosen.

Data Collection Sheets

A sample data collection sheet appears in Chapter III. The elements to be collected are printed at the top of each column. The project supervisor should detemine the number of sheets required, based on the sample size or duration and the collection size. The project supervisor may want to devise another method of collecting the information, such as using a separate slip on which to record the information for each item sampled. The advantage of "sortability" may be worth the additional expense and inconvenience this procedure would cause.

Data Collection Log

A sample data collection log follows the sample data collection sheet in Chapter III. The project supervisor may use this as a model, deciding what items are important to record; the project supervisor also will be able to estimate the number of log sheets required.

Study Schedule

The project supervisor may find it helpful to set up a schedule like the one included as an example in Chapter III, for keeping track of the data collection teams and supervisors. A combination schedule and data collection log may help simplify the data collection process.

CHOOSE AND TRAIN DATA COLLECTORS

The project supervisor should choose the members of the data collection team according to the procedures to be carried out and available staff time. A formal training workshop or workshops should be scheduled, and each data collector should attend. Plans for this workshop are outlined early in Chapter III. The workshop, given in an unhurried fashion, will provide the data collectors some hands-on experience and an appreciation of the concerns (e.g., accuracy). A monitoring role for supervisors can be introduced--a role which will need to continue throughout the data collection phase, with inspections assuring quality and preventing the need to redo parts of the sample. The following are suggestions for each data collection method.

Circulation Sample

Some likely staff members to carry out this routine are:

- Part-time or full-time circulation assistants.
- Special assistant employed for the duration of the study.
- Student assistants.

Since the circulation sample is a direct record of daily circulation it should be collected each day including weekends. Some combination of the above staffing choices, such as data collection by a circulation assistant during the week and by a reliable student assistant on weekends, may best serve the needs of the library. It may also be possible to "batch" these items, and record them, for example, every other day.

Stack Sample

Since this process is separate from normal library operations, new staffing is necessary. This is probably an advantage since those assigned to conduct the stack sample collecton will not be required to perform other tasks during the period of the study, as will likely be the case for those collecting the circulation samples. Also, the stack sample can be conducted any time the library is open. Some staffing possibilities:

- Permanent part-time or full-time staff members who may wish to work additional hours during the study.
- Permanent part-time or full-time staff members whose jobs are flexible enough to permit their assignment to the study for a short time.
- Part-time staff persons hired specifically for carrying out the data collection.
- Student assistants who are available for a short-term project.

The supervisor should note that staffing in teams of two is recommended for the stack sample data collection.

Shelflist Sample

The suggestions mentioned above for the stack sample data collection can be used if a shelflist sample is chosen, either separately or in conjunction with a circulation sample. It should be noted, though, that recommended staffing is in two separate teams of two for this procedure.

[INSERT "SAMPLE SIZE BY VOLUMES OWNED" HERE]

SAMPLE SIZE BY VOLUMES OWNED

Number of Volumes	Percent of Sample									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
50,000	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
60,000	600	1200	1800	2400	3000	3600	4200	4800	5400	6000
70,000	700	1400	2100	2800	3500	4200	4900	5600	6300	7000
80,000	800	1600	2400	3200	4000	4800	5600	6400	7200	8000
90,000	900	1800	2700	3600	4500	5400	6300	7200	8100	9000
100,000	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
110,000	1100	2200	3300	4400	5500	6600	7700	8800	9900	11000
120,000	1200	2400	3600	4800	6000	7200	8400	9600	10800	12000
130,000	1300	2600	3900	5200	6500	7800	9100	10200	11500	13000
140,000	1400	2800	4200	5600	7000	8400	9800	11200	12600	14000
150,000	1500	3000	4500	6000	7500	9000	10500	12000	13500	15000
160,000	1600	3200	4800	6400	8000	9600	11200	12800	14400	16000
170,000	1700	3400	5100	6800	8500	10200	11900	13600	15300	17000
180,000	1800	3600	5400	7200	9000	10800	12600	14400	16200	18000
190,000	1900	3800	5700	7600	9500	11400	13300	15200	17100	19000
200,000	2000	4000	6000	8000	10000	12000	14000	16000	18000	20000
210,000	2100	4200	6300	8400	10500	12600	14700	16800	18900	21000
220,000	2200	4400	6600	8800	11000	13200	15400	17600	19800	22000
230,000	2300	4600	6900	9200	11500	13800	16000	18400	20700	23000
240,000	2400	4800	7200	9600	12000	14400	16800	19200	21600	24000
250,000	2500	5000	7500	10000	12500	15000	17500	20000	22500	25000
260,000	2600	5200	7800	10400	13000	15600	18200	20800	23400	26000
270,000	2700	5400	8100	10800	13500	16200	18900	21600	24300	27000
280,000	2800	5600	8400	11200	14000	16800	19600	22400	25200	28000
290,000	2900	5800	8700	11600	14500	17400	20300	23200	26100	29000
300,000	3000	6000	9000	12000	15000	18000	21000	24000	27000	30000

CHOOSE DATA ANALYSIS PROCEDURES

Manual Analysis

The manual analysis procedures detailed in the Guide are recommended for ease of implementation and interpretation. They are particularly useful if the sample is of a manageable size, and if the staff team which managed the data collection can also carry out the data analysis.

Computer Analysis

Computer-assisted analysis is also possible, and may be preferable if:

- The sample size would result in unwieldy manual processing.
- Computer assistance for data input, programming and processing is readily (and inexpensively) available.
- The cost or availability of staffing for manual processing is unsuitable.

Computer facilities and programming capabilities differ from one institution to another. Even if two campuses have similar computer hardware, it is unlikely that programs would be transferrable from one to another without local modification.

The Lake Forest Case Study lists the programs used in the pilot study, illustrating the processing routines written in the computer language using the Statistical Package for the Social Sciences (SPSS).

The computer program design problems encountered during the pilot study included:

- Keypunch format: call number fields usually contain a combination of alphabetic numberic characters, and are of varying lengths.
- Grouping by subject: most computer programming languages do not allow for combining items by alphabetic characters. In the pilot study an additional program was used to carry this out.
- Data file construction: the choices of data file arrangement for ease of manipulation ranged from using one large file to separating each file by method of collection and subject. The pilot study used one main file, and areas of interest were selected within the program.
- Out-of-range data values: some data errors are inevitable. Checks much be incorporated into the program to spot "impossible" entries, such as a publication year of 1995.

CHOOSE DATA ANALYZERS

If the data is to be analyzed manually, those who will compile and analyze it will probably be chosen from the group of data collectors, since their time will have been set aside for the project and since they will be familiar with the data by the end of the collection phase. The project supervisor can assign different individuals to work with separate analyses at the same time, working with photocopies of the data to speed the process. The actual choice of data analyzers can be delayed until later in the project, when the project supervisor can identify those who would work best with the data.

CHAPTER III: IMPLEMENTATION

Before the actual training of the data collectors, the project supervisor should prepare the following:

- Data collection sheets in sufficient quantity to accommodate the sample sizes. (Sample follows.)
- Data collection logs and schedules, arranged according to the chosen staffing patterns. (Samples follow.)
- Data collection and analysis guides for each data collector. The sample guide included in this manual can be copied directly or modified to fit local circumstances.
- A brief statement about the study for the information of the data collectors.
- Some samples of items from which the data will be taken, e.g., circulation cards, volumes or shelflist entries.

The project supervisor should also decide what staffing patterns would be most practical, and set up a proposed schedule accordingly.

MEET WITH DATA COLLECTORS

It is recommended that all potential data collectors attend an organization and training workshop, at which the project supervisor (and other staff, if available) can:

- Introduce the data collectors to the study: its purpose, schedule, and methodology.
- Distribute the information, including the data collection guides.
- Schedule the data collectors according to the type of sample or samples to be collected and the staffing pattern chosen.

The data collectors can then be divided into groups, if more than one method of data collection is to be undertaken. If one sample is being collected or if the number of data collectors is small, it will not be necessary, of course, to separate the group for training.

The project supervisor should review the pertinent sections of the data collection guide with each group. After questions are answered, the data collectors should collect some data from sample material prepared by the project supervisor, so that the necessity for consistency will be reinforced and the data collectors can judge for themselves the simplicity of the task.

The scheduling for data collection should be defined as soon as possible so that the duration of the study can be estimated. The supervisor can use any scheduling routines that seem suitable, either based on the sample log and schedule, or on a locally devised system.

DATA COLLECTION SHEET

ITEM NUMBER	CALL NUMBER FIRST 2 FIELDS	CALL NUMBER REMAINDER	PUBLICATION YEAR	LAST CIRCULATION DATE	OPTIONAL

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DATA COLLECTION SCHEDULE-CIRCULATION AND OR STACK SAMPLE

		S	M	T	W	TH	F	SAT
9:30	C							
	S							
	S							
10:30	C							
	S							
	S							
11:30	C							
	S							
	S							
12:30	C							
	S							
	S							

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DATA COLLECTION LOG

SAMPLE_____

DATE	NAME	ITEM NUMBER		TIME	
		IN	OUT	IN	OUT

It is important to emphasize the necessity for conscientious attendance to the data collection routines: as mentioned in the data collection guide, real usable outcomes of the project depend entirely on the quality of the collected information.

COLLECT DATA

The data collection guide, which should be distributed to all data collectors, follows as a separate section. Project supervisors are free to change or augment this guide in any way to make it more pertinent to local conditions. It should be noted beforehand that the routines in the data collection guide are described with certain record-keeping practices in mind, such as the use of book circulation cards and due-date slips. Supervisors may be required to adapt records or augment certain portions of the manual (such as directions for locating certain data items) before training the data collectors.

REPORT TO ADVISORY GROUP

The project manager should be able to discern fairly quickly how the data collection is progressing; any snags will certainly be brought to her or his attention, and the data collection log should help estimate the length of time the process takes.

A report to the Advisory Group would be appropriate even before the data collection is completed, if the project supervisor can arrange to conduct some analyses on a portion of collected data, for purposes of illustration. It is recommended that the project manager do these sample analyses for two reasons:

- Explaining the resulting data to library staff and Advisory Group members will be made much simpler if the project supervisor is familiar with the results' meanings.

- Explaining the process to the potential analyzers will be simplified by the project supervisor's first-hand experience.

The Advisory Group should determine at this time the number and kinds of analyses they would like completed as part of the project and which can be delayed for later discussion. The report can be in any format considered appropriate, such as a written summary of activities and findings of data, an informal discussion with some of the group members, or a more formal presentation to the Advisory Group and the library staff. In any case, this communication should take place before information about the study and its preliminary findings are publicized campus-wide. This is important for two reasons:

- The faculty Advisory Group members may be able to suggest some contextual reasons for certain findings which are not readily evident to the project supervisor or other library staff.
- The Advisory Group members should be encouraged to participate very actively in the dissemination of information about the project through whatever channels are available, such as departmental meetings, memoranda and presentation at general faculty meetings.

The tone of the preliminary report to the general campus community will be informally informative; a more complete report will come later.

PREPARE REPORT ON FINDINGS

After the data has been collected, compiled and analyzed, the project supervisor and the library director should prepare a report which will serve as a vehicle for discussion with the Advisory Group. The report should incorporate:

- The expectations about the study (if any) which existed at the beginning of the project
- The results, both general and according to specific fields
- Information supplied by the Advisory Group and the other faculty about the library collection's characteristics
- Some general suggestions for application of the results (See "Possible Applications" section in Chapter IV)

MEET WITH ADVISORY GROUP

Using the report prepared by the project supervisor and library director to begin discussion, the Advisory Group and interested library staff should meet in a working session to:

- Review carefully the findings of the study, especially the interpretations of the analyses
- Evaluate, in general, the accuracy and usefulness of the results
- Discuss ways of applying the information to help program planning, facilities planning and collection development
- Consider the possible difficulties which might arise because of different interpretations of the results and how these are to be resolved
- Formulate a statement of approval (if appropriate) regarding the study's methodology and findings
- Define a set of specific recommendations upon which the Advisory Group agrees, to be forwarded to the faculty and administrative offices for consideration
- Identify and approve members of the Advisory Group and library staff to conduct further action and communicate, either on campus or elsewhere, about the study process, the results, and the group's recommendations.

CHAPTER IV: FOLLOWUP

The analyses described in the previous chapter contain a great deal of information which can be used to make policy and program decisions. However, it is not always easy to see how the results of the analyses can be best used. This section first describes several hypothetical library situations and shows how the analyses' results might be applied to them. These examples may not be appropriate for all libraries and there are doubtless other situations which could also be addressed by the data. Second, this section provides details on some experiences using the data at Lake Forest College, in order to show the range of purposes to which one library applied the results of the study. Reading the examples provided here should help library staff develop facility with the data, enabling them to tailor the analyses to meet their own goals.

POSSIBLE APPLICATIONS

It is important to realize that gaining familiarity with the data and analyses is the best way to ensure that the study will be useful in a library's situation. The applications mentioned here are merely suggestions for beginning to apply the results; the project supervisor and the library director will doubtless become familiar enough with the results to propose more pertinent ones.

In general, the applications can be seen to affect three segments of the library programs: user services, technical services, and facilities planning. Many of the following suggested applications are pertinent to more than one of these library functions. The following chart indicates some applications, the areas a specific application might affect, the data collection method or methods which contain the appropriate data elements, and the analyses which yield the necessary information. The same processes can be applied to the collection as a whole or to subareas of the collection. The recommended collection method is a combination circulation/stack sample, as mentioned earlier. The following applications are stated with this as a given; those who collect other kinds of samples can extrapolate from this information to arrive at possible uses of the data.

[INSERT "POSSIBLE APPLICATIONS" HERE]

Possible Applications

Application	Function			Appropriate Method			Appropriate Analyses				
	User Services	Technical Services	Facilities Planning	Circulation	Stack or Shelflist	Circ/Stack	1	2	3	4	5
Core Collection	X		X	X	X	X				X	
Library Instruction to increase use	X				X	X	X		X		
Implementation of automated circulation system		X	X	X		X	X			X	
Weeding	X	X	X	X		X		X		X	
Reference/Research assist. staffing	X				X	X			X		
Materials budget allocation	X	X			X	X	X			X	
Review of purchased materials		X	X		X	X	X	X		X	X
Reclassification of collection	X	X	X	X		X	X			X	
Installation of electronic security system	X		X	X		X				X	

It is also assumed that the data analyzers have compiled all five analyses for the general collection and for each subarea of interest. A table suggesting subject classifications is included in this chapter.

[INSERT "SUGGESTED SUBJECT FIELD CLASSIFICATIONS" HERE]

Core Collection

Some librarians may want to identify the most frequently used materials in the collection or in selected disciplines to build a "core collection" to place in a specific location or to assign different circulation periods. The library staff would:

- Decide upon the desired percent of current circulation to be taken care of by the core collection (from Analysis 4, column 6 of the circulation sample)
- Identify the Last Circulation Date (from Analysis 4, column 2 of the circulation sample) which corresponds to the desired percent
- Looking at the stack sample Analysis 4, identify the percent of the stack sample (column 6) which corresponds to that year (column 2)
- Estimate the number of volumes of the collection this will identify for the core collection. If this is too large or too small for the space designated for the core collection, the staff would choose a more appropriate percentage and follow the same procedures.

Library Instruction

Many libraries are involved in organized library instruction to help students identify the materials they need and make more efficient use of the library. The study results can help pinpoint areas which are neglected and those which are overused so that, after determining the worth of the materials, librarians can make recommendations about their use. To derive this information one would:

- Compare the call number percentages from the circulation sample Analysis 1 to those in the stack sample Analysis 1 to discover discrepancies in amount of use compared to the size of the collection

To identify times of the year when library instructions in specific fields would be most useful, the library staff would:

- Compare the monthly use cycles as described in Analysis 3 for the subareas of the collection which have been identified as pertinent.

SUGGESTED SUBJECT FIELD CLASSIFICATIONS

Subject	LC Classes	Dewey Classes
1. Anthropology	GN, CC	570-573
2. Art	N, TR	800-770
3. Athletics	G, V	796
4. Biology	QH-QR	570-599, 610-619, 630-639
5. Chemistry	QD	540-547, 660-669
6. Classics	PA	470-489, 870-879
7. Economics and Business	HB-HJ	330-339, 380-389, 657-659
8. Education	L	370-379
9. English	PN, PR, PS, PZ	400-249, 800-829
10. Geology	QE, GA-GC, TC, TN	548-569
11. History (Non-Western Hemisphere) History (Western Hemisphere)	C, D E, F	900-969, 980-999 970-979
12. Home Economics	TX, TT	640-649
13. Linguistics, Language and Literature other than English	P except PA, PN, PR, PS, PZ	430-469, 830-869
14. Mathematics	QA	510-519
15. Medicine	R	610-619
16. Music	M	780-789
17. Philosophy	B-BD, BH, BJ	100-149, 160-199
18. Physics	QB, QC	520-539, 620-629
19. Political Science	J, K, HX	320-329, 340-354
20. Psychology	BF	150-159
21. Religion	BL-BX	200-299
22. Sociology	HM-HV	300-309, 380-389, 390-399

Implementation of Automated Circulation

To identify the materials whose records should be included as soon as possible in a new circulation system, the library staff would follow similar procedures to those described above for establishing a core collection. For instance, the staff would:

- Identify the appropriate percent of the current circulation which should be included (usually as much as possible), from the circulation sample Analysis 4 column 6
- Identify the corresponding last circulation date in column 2, of the same analysis
- Flag all items with this circulation date, or a more recent one, for input.

If the library staff also want to estimate the number of items this would involve, they would then:

- Match the decided-upon year since circulation from the circulation sample Analysis 4 with the same figure for the stack sample Analysis 4
- Identify the corresponding cumulative percent from the same analysis column 6.

Location of Materials

A library may find that arrangements must be made for shelving other than in the traditional manner; some other building on campus may have space which can be used to house materials of less than prime importance, but which should be kept. Compact storage for a specific number of volumes might be under consideration. If recency of use is the pertinent criterion, the library staff would do the following:

- Identify the number of volumes to be moved to additional space.
- Identify the percent of the collection (or subcollection) which equals this number.
- Subtract this number from 100%.
- Find the cumulative percent of the collection in Analysis 4, column 6 of the stack sample which corresponds to that number (100-n%) to determine the percent of materials which were least frequently used.
- Use the corresponding last circulation date in checking the collection (or subcollection) for those to be relocated.

If the criterion for relocating books is age, the library staff would:

- Identify the percent of collection to be moved.
- Find the cumulative percent of the collection in the stack sample in Analysis 2 column 5 which corresponds to that percent.
- Note the age of the book which corresponds to that percent.
- Check the collection (or subcollection) for books with that publication year or any publication year earlier.

Weeding

The weeding function is very important in any undergraduate library, especially in one which realizes the efficiency of the "steady-state" concept. Data from this study can provide an additional measure to the ones usually applied to identify items which might be weeded or located elsewhere, as mentioned above. The same procedures as those described for "Location of Materials" can be implemented to help the weeding process.

Reference Staffing

The staff members of smaller academic libraries are often required to fulfill more than one function; having some indication of the times of the year during which certain kinds of reference assistance is needed can help with scheduling staff time. The library staff would:

- Use Analysis 3 for the stack sample to graph the patterns of use in the disciplines of interest
- Note that these are relative percents, not cumulative ones, so that a yearly use pattern would result.

Materials Budget Allocation

A library which is reviewing its purchase procedures may want an indication of the use selected areas of the collection receive. The staff would:

- Define what call numbers fall into the disciplines defined by local use
- Add the percents of the call number from stack sample Analysis 1 column 4 to arrive at a total percent for each discipline (the classifications used in the pilot study are found in the "Suggested Field Classifications Chart"
- Do the same procedures using circulation sample Analysis 1
- Match each pair of numbers (circulation sample and stack sample percents) for each defined discipline
- Note the amount of circulation in each discipline as compared to the amount of materials in the collection for each discipline to indicate where additional purchases might be necessary to increase use, or to suggest other modifications in the budget allocation.

Review of Purchased Materials

In addition to the above procedures for gaining information to facilitate the budget process, the library staff can also review purchases for the collection in general or in a specific area, by year of publication:

- From the stack sample Analysis 5 for each area of interest, find the total percent not circulated in that subject
- Find the total percent not circulated for the general collection for the stack sample Analysis 5
- Compare this number from the general collection with the same figure from areas of interest.

Reclassification of the Collection

A library may decide to convert its collection from one system of classification to another. The same procedures suggested above for implementing an automated circulation system, whereby the areas of most frequent use can be identified, can be applied here as well.

Installation of Electronic Security System

The installation of detection devices into library books can be facilitated by identifying the areas which receive most circulation. This process has much in common with the ones mentioned above for implementing an automated circulation system and reclassifying a collection. In this case, though, the number of items to be "sensitized" is usually limited by the number of devices available. The library staff would:

- Define the number of items for which sensing devices are available
- Identify the percent of the total collection which this equals
- From the general stack sample Analysis 4, find in column 6 the corresponding percent
- Find the corresponding percent in column 2 of the circulation sample analysis
- Find the same year in the circulation sample Analysis 4
- Identify the corresponding percent in column 6 of the same analysis which indicates the amount of current circulation to be covered by sensitizing that percent of the collection
- If this percent is satisfactory, identify all the items in the collection whose last circulation is within the defined length of time. This procedure can be carried out by subareas of the collection as well.

These are intended as examples only: the greater the project supervisor's familiarity with the data, the greater will be the number of local applications. Data interpretors should also take advantage of the effectiveness of graphs to help interpret the results an compare different findings.

PRESENT TO FACULTY FOR DISCUSSION AND APPROVAL

The presentation of the Advisory Group's final recommendations to their faculty colleagues should be preceded by substantial publicity, to help ensure some level of understanding and acceptance of the study methodology and results. Experience has indicated that continuing informal publicity about a project like this is much more readily accepted than formal documentation issued on an irregular basis. This is especially true if interested faculty are secure in the knowledge that more detailed, formal information is available if needed.

The discussion with the faculty can be presented by the library director, the project supervisor or a designated member of the Advisory Group. Items of interest will undoubtedly include:

- The methodology of the study
- Comparison of results between departments
- Implications of the study for the college curriculum
- Some pertinent applications
- Recommendations supported by the Advisory Group.

It is important that the study's results and recommendations be described as having positive potential, to avoid misunderstanding of their significance.

A brief memorandum or other form of informal communication should follow by a few days the faculty discussion of the study to reinforce the information and recommendations issued at the meeting.

Faculty appreciation of the role of the library in maintaining the quality of their institution is important; the library, of course, recognizes and usually fosters active faculty interest and involvement in library issues. The opportunity to act upon the results of this study may be welcome by many faculty members, who can act in their capacities as academic committee members or department chairpersons to help implement the Advisory Group's recommendations.

IMPLEMENT RECOMMENDATIONS

Putting into action the recommendations for augmenting programs, collection development and space planning in the library, constitutes the end of the study. But it is hoped that the final step in the process becomes an ongoing one as the library meets the challenges of austerity with the advantages of creative staff, interested faculty, and a climate for cooperative program and collection development.

The Lake Forest College Experience: One Case

Lake Forest College, the headquarters school for the 1980 ACM study, provides one useful example of the range of uses to which collection use data can be put. Notable applications of the study findings have included installation of strips for an electronic security system, review of purchased materials, and an approach to the issues of a core collection and of weeding as part of a space expansion project. The study findings helped the College focus on the need for more library space, and helped the library focus on use as a framework for effective planning.

While Lake Forest's strategy for placing detection strips offers nothing unusual, the College's experience in purchase review and in collection shaping and arrangement relating to space pressures helps demonstrate the relevance of collection use study results for college libraries.

At Lake Forest our initiative in the direction of systematic purchase review needs to take into account the central role of the teaching faculty in book selection. Given a shared acceptance of potential student use as a key criterion for title selection, Lake Forest has found faculty (rather than librarians) generally to be the better predictors of potential use of a title, thus the better selectors. The 1980 study data bore this out, since the percentage of uncirculated titles seemed acceptably low in most cases. In the cases of some disciplines, though, the percentage of unused titles was higher than the College-wide norm. In these fields, department chairs or library liaisons were invited soon after the 1980 study to examine the actual sample on which the study results were based to see if they could note any pattern in the items that did not circulate. For each discipline (or academic department) the full 4% stack sample (one book in each 25) was pulled and assembled on some free stacks; each sample was divided into four categories:

1. Books that circulated, 1960-1970 publication dates.
2. Books that did not circulate, 1960-1970 publication dates.
3. Books that circulated, 1971-1980 publication dates.
4. Books that did not circulate, 1971-1980 publication dates.

One representative of each discipline came and reviewed the sample for his/her field, accompanied by a librarian. These included two departments

that accounted together for about one-third of the total circulation. The librarian present in each instance functioned as recorder, noting down observations of the teacher/selector. In one field the 1971-1980 sample showed a small number of heavily used, newer books in an area of the discipline for which interest was growing rapidly. More titles appeared to be needed here. Conversely, several standing orders, reaching back two decades, appeared to go unused. By shifting purchasing patterns with the money traditionally spent on that discipline, urgent new needs could be met. In other fields, works relating to or by well-known figures were seen to circulate, while material about and by more obscure figures languished. Given local resource sharing options, it appeared we could relax efforts to acquire minor figure-related sources. Generally, the teachers saw patterns which had escaped the librarian. Also, the librarian avoided taking away "ownership" of collection responsibility from teachers, but structured a setting in which teachers could evaluate their own selection experience.

A second Lake Forest experience with its 1980 study data related to efficiency of space. With shelves quite tight in the early 1980s, Lake Forest's library obtained additional space in its building, previously used to house offices and classrooms for three academic departments. Original plans had called for converting this space to library use in 1970; a decade later simply spreading out the collection as originally intended would leave the space "full" on opening day, a sobering thought. Also, the building energy budget already exceeded the book budget. Finally, the study suggested that further weeding would bring diminishing returns, especially given emerging resource sharing patterns. As bibliographic records were converted on OCLC for a new automated circulation system, outside requests for long-uncirculated items grew steadily. To maintain the collection size along with the comfortable study character of the library, it was decided after discussions to sort the collection along the lines of the study findings: the 40% of the collection receiving 80% of the use would remain on the library's upper level, as laid out for use by Keyes Metcalf; the portion of the collection which predictably would yield only 20% of the total use would be shelved in the new space on the lower level--with narrower aisles, less felicitous lighting, infrequent carrels, etc. Thus, two LC class orders, from A to Z would be maintained--one for "core" or frequently consulted materials, one for "research" or more rarely called-for items. Locations (upstairs or downstairs) would be displayed on the public access terminals of the automated system. By 1984 the process of dividing the collection into two levels was well underway, with over 25,000 titles moved from the upper (regular) stacks to the new, more storage-like stacks. Because of the small size of the library, patrons can still browse both collections. Space pressures have been reduced at relatively little cost. As time passes and space pressures build again, the second-hand storage stacks can yield to compact storage. Materials can shift back and forth as needed, with only a simple maintenance operation on the automated system required to keep records current.

The sorting operation itself, carried out by student assistants in summer months, used that last circulation date for each field that marked the number of years back in time needed to predict 4 out of 5 requests from the "core". Thus, in one field books circulated within the last 2 1/2 years provide the 40% or so of the collection satisfying 80% of the circulation demand. In another area, a date four years back was necessary to reach the 80% level.

```
RUN NAME            LAKE FOREST COLLEGE, SUBJECT ANALYSES, CIRCULATION SAMPLE
VARIABLE LIST       NUMBER, CALL 1, CALL 2, SUBJECT, CALL T, PUBDATE, MONTH, DAY, YEAR,
                      FOUND, SCHOOL, SAMPLE
INPUT FORMAT        (A5, A3, A8, T47, F2, 0, 1X, F1, 0, F4, 0, 3F2, 0, 3F1, 0)
```

ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS:

VARIABLE	FORMAT	RECORD	COLUMNS
NUMBER	A 5	1	1- 5
CALL 1	A 3	1	6- 8
CALL 2	A 8	1	9- 16
SUBJECT	F 2. 0	1	47- 48
CALL T	F 1. 0	1	50- 50
PUBDATE	F 4. 0	1	51- 54
MONTH	F 2. 0	1	55- 56
DAY	F 2. 0	1	57- 58
YEAR	F 2. 0	1	59- 60
FOUND	F 1. 0	1	61- 61
SCHOOL	F 1. 0	1	62- 62
SAMPLE	F 1. 0	1	63- 63

THE INPUT FORMAT PROVIDES FOR 12 VARIABLES. 12 WILL BE READ.
IT PROVIDES FOR 1 RECORDS (*CARDS*) PER CASE.
A MAXIMUM OF 63 *COLUMNS* ARE USED ON A RECORD.

```
N. OF CASES         13935
RECODE              SUBJECT TO SAMPLE (BLANK = -9.)
SELECT IF           (SAMPLE EQ 1)
IF                      (PUBDATE LT 1700 or GT 1980) PUBDATE = -9.
IF                      (YEAR SQ -9, AND PUBDATE NB -9.)  YEAR = (PUBDATE-1900.)
IF                      (MONTH LT 1 OR GT 12) MONTH = -9.
IF                      (DAY LT 1 OR GT 31) DAY = -9.
IF                      (YEAR LT 0 OR GT 80) YEAR = -9.
RECODE              SUBJECT TO SAMPLE (-9. = -1.)
ASSIGN ----?        PUBDATE, MONTH, DAY, YEAR (-1)
COMPUTE
COMPUTE             T1 = ???*12.
COMPUTE             T2 = 6-MONTH
COMPUTE             MSC =T1 + T2
IF                      (YSC LT 0 OR GT 80) YSC = -1.
IF                      (MSC LT 0 OR GT 1000) MSC = -1.
COMPUTE             DATE INT = PUBDATE
RECODE              DATE INT (1800 THRU 1900 = 1900) (1901 THRU 1905 = 1905)
                        (1906 THRU 1910 = 1910) (1911 THRU 1915 = 1915)
                        (1916 THRU 1920 = 1920) (1921 THRU 1925 = 1925)
                        (1926 THRU 1930 = 1930) (1931 THRU 1935 = 1935)
                        (1936 THRU 1940 = 1940) (1941 THRU 1945 = 1945)
                        (1946 THRU 1950 = 1950) (1951 THRU 1955 = 1955)
                        (1956 THRU 1960 = 1960) (1961 THRU 1965 = 1965)
                        (1966 THRU 1970 = 1970) (1971 THRU 1975 = 1975)
                        (1976 THRU 1980 = 1980) (???? = -1)
```

```
ASSIGN MISSING YSC, MSC, FOUND, DATE INT (-1)
VAR LABELS      CALL 1  CALL NUMBER FIELD 1/
                CALL 2  CALL NUMBER FIELD 2/
                SUBJECT  SUBJECT FIELD/
                CALL T  CALL NUMBER TYPE/
                PUBDATE  PUBLICATION DATE/
                MONTH  MONTH OF LCD/
                DAY  DAY OF LCD/
                YEAR  YEAR OF LCD/
                YSC  YEARS SINCE CIRCULATION/
                MSC  MONTHS SINCE CIRCULATION/
                FOUND  BOOK LOCATED?/
                SCHOOL  PILOT SITE/
                SAMPLE  TYPE OF SAMPLE/
                DATE INT  PUBLICATION DATE INTERVALS/

LAKE FOREST COLLEGE, SUBJECT ANALYSES, CIRCULATION SAMPLE                    7/15/80

        VALUE LABELS        SCHOOL (1) ST. OLAF  (2) LFC  (3) KNOX/
                            SAMPLE (1) CIRC  (2) STACK  (3) SHELF/
                            SUBJECT (1) ART  (2) MUSIC  (3) LANG, FOR LANG & LIT
                            (4) ENGLISH  (5) POLI SCI  (6) EDUCATION
                            (7) HISTORY  (8) PSYCHOLOGY  (9) ANTHROPOLOGY
                            (10) MATHEMATICS  (11) PHYSICS  (12) CHEMISTRY
                            (13) BIOLOGY  (14) PHILOSOPHY  (15) RELIGION
                            (16) ECONOMICS  (17) SOCIOLOGY  (18) HOME ECON
                            (19) MEDICINE  (20) AMER HISTORY  (21) ATHLETICS
                            (22) CLASSICS  (23) GEOLOGY  (24) OTHER/
                            CALL T  (Q) LC  (1) DEWEY/
        PRINT FORMATS       NUMBER, CALL 1, CALL 2 (A)
        TASK NAME           ART BOOKS (LC = N, TR)
        *SELECT IF          (SUBJECT EQ 1)
        FREQUENCIES         GENERAL = SUBJECT, PUBDATE, MONTH, YSC, MSC, FOUND
        STATISTICS          ALL

FREQUENCIES -  INITIAL CM ALLOWS FOR 1660 VALUES
               MAXIMUM CM ALLOWS FOR 15932 VALUES
```

SELECTIVE BIBLIOGRAPHY

Alverno College, Library Media Center. The Circulation Use of the Alverno College Library Collection. Milwaukee: Alverno College, 1982, 96p. A report on the application of the ACM manual with an OMS Small College Library Program Assisted Self-Study. Analyses done manually by the library staff, without an outside consultant. Covers A-V also and includes a comparative analysis to the three ACM school results. The supervising head librarian was Cathleen Bourdon, now in the ACRL office at ALA, Chicago.

Broadus, Robert N. "Use Studies of Library Collections." Library Resources & Technological Services, 24 (1980), 317-324. Among key findings of use studies, "we are fairly sure" in-library use "mirrors in some respects...the recorded circulation" and "that, of the present books and articles in the library, the ones most likely to be in demand in the future are the ones used in the immediate past."

Budd, John. "Libraries and Statistical Studies: An Equivocal Relationship." Journal of Academic Librarianship, 8 (1982), 278-281. In any quantitative library study, be thorough; also adapt your method to your specific situation and allow for qualitative judgements.

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Jain, A. K. "Sampling and Data Collection Methods for a Book-Use Study." Library Quarterly 39 (July 1969), p. 245-52. Gives a good brief background on the purposes of use studies and proposes a "relative use" study method to yield a more accurate data of the use of collection in general. Presentation of methods and terminology make this useful information harder to understand and apply than necessary.

Jain, A. K. "Sampling and Short-Period Usage in the Purdue Library." College and Research Libraries 27 (May 1966), p. 211-18. Testing methods of data collection of a small section, chooses shelflist as best way of sampling over stacks or card catalog. Chooses systematic over random sampling methods. Supports statement regarding relationship between age and use of material. Statistical-language format makes information not readily understood by general audience.

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Magrill, Rose Mary. "Evaluation By Type of Library." Library Trends, 33 (1985), 267-295. Provides an overview of the ways various studies differ from one type of library to another. One section deals with small and medium-sized versus large academic libraries, including a description of the original ACM study and citing manual.

Nisonger, Thomas E. "An Annotated Bibliography of Items Relating to Collection Evaluation in Academic Libraries, 1969-1981." College & Research Libraries, 43 (1982), 300-311. Supplements Signe Ottersen's "A Bibliography on Standards for Evaluating Libraries," College & Research Libraries, 32: 127-144, which ends with 1969.

"Pittsburgh University Studies of Collection Use: A Symposium." Journal of Academic Librarianship 5:2 (May 1979), p. 60-70. Reactions from several points of view regarding the methodology and results of the Pitt Study, including a response statement by Richard Trueswell. A good overview of the praise and criticisms which greeted the study's publication, and which make the implementation of any use study a matter for careful consideration.

Trochim, Mary Kane. "Measuring Academic Library Use: The ACM Model." ALA Yearbook: Library Events 1980, 6 (1981), 26-28. Summarizes the original project and includes two tables of results for the three schools: (1) "Percent in each collection which satisfies 80% of circulation and corresponding year since circulation, by subject area" and (2) "Subject field percentages from each sample at each college," p. 27.

Sargent, Seymour. "The Uses and Limitations of Trueswell." College and Research Libraries 40:05 (September 1979), p. 416-423. Explains a local study which attempts to combine quantitative and qualitative information to derive collection use through an unusually small (.34%) sample; takes issue with the standard analysis suggested by Trueswell, based upon misinterpretation of Trueswell's findings.

Seymour, Carol A. "Weeding the Collection: A Review of Research on Identifying Obsolete Stock." Libri 22:2 (1972), p. 137-148. Reviews research on identifying little-used sections of a collection; provides coherent and useful summary of Trueswell's methodology among others which are used solely or partially for weeding programs.

Trueswell, Richard W. "Determining the Optimal Number Volume for a Library's Core Collection." Libri 16:1 (1966), p. 49-60. An early explanation of the use of Last Circulation Date as a major criterion for indicating use; also states possible applications of results from circulation sample and stack sample.

Trueswell, Richard W. "Growing Libraries: Who Needs Them? A Statistical Basis for a No-Growth Collection." in Gore, Daniel, Farewell to Alexandria. Westport CT: Greenwood, 1976. Essential reading for libraries considering a study using the Last Circulation Date as a major element. Outlines the growing necessity for a steady-state or "no-growth" collection, and points out ways in which circulation data can be collected and manipulated. Shows the origin of the "operating characteristic curve," which yields information about what percentage of the collection satisfies a certain acceptable percentage of current use. Also indicates that the circulation data does not change markedly over time but that data about the stocks contents does.

Trueswell, Richard W. "Some Circulation Data from a Research Library." College and Research Libraries 29:06 (November 1968), p. 493-495. A brief description of the number of items circulated per user over a given period of time.

Trueswell, Richard W. "The Uses and Limitations of Trueswell: A Comment." College and Research Libraries 40:05 (September 1979), p. 424-425. Response to Sargent's claim that Trueswell's procedures produce fallacious information; states Sargent's errors in logic and research, and redefines the elementary procedures usually applied by Trueswell. Indicates similarity of findings between previous studies by Trueswell and Sargent's research, when the appropriate criteria are applied.

Trueswell, Richard W. and Stephen J. Turner. "Simulating Circulation Use Characteristic Curves Using Circulation Date." Journal of the American Society for Information Science (March 1979), p. 83-87. A statistical explanation of the use of circulation data only to derive a collection curve, and by extension, an operating characteristic curve for a given library collection provided that certain data are available. Aimed at academics familiar with mathematical functions.

Turner, Stephen J. "Trueswell's Weeding Technique: The Facts." College and Research Libraries (March 1980), p. 134-138. A straightforward statement of the "Trueswell" approach; also suggests applications of the results and responds to some previously stated misinterpretations of the Last Circulation Date notion.

University of Pittsburgh, Graduate School of Library Science. A Cost-Benefit Model of Some Critical Library Operation in Terms of Use of Materials. Pittsburgh: University of Pittsburgh, 1978. Also known as the Kent Report, this document defines and explains the 8-year study and proposes library actions based upon the findings. See also Galvin, Thomas J. and Allen Kent, "Use of a University Library Collection." Library Journal 102:20 (November 1977), p. 2317-20. A summary of the methods and findings; also heralds the Pitt Study as a milestone in library research.

White, G. Travis. "Quantitative Measures of Library Effectiveness." Journal of Academic Librarianship 3:3 (July 1977), p. 128-136. A good survey of recent (1961-1975) library effectiveness studies from various points of view. Mentions circulating collection use studies as useful procedures.

DATA COLLECTION AND ANALYSIS GUIDE

INTRODUCTION

The study in which you are about to participate is designed to help small college libraries make the most of their resources by identifying which materials their patrons rely upon most for outside-the-library use. Your role in this study is the central one: the importance of consistent and accurate collection of the information cannot be overemphasized, because it is this information upon which the study's results will be built.

STAFFING

The project supervisor will assign you to one of the data collection methods outlined here. If it is the circulation sample, you will work individually, collecting the data from the circulation records at the circulation desk. If you are assigned to a stack or shelflist sample, you will work as a member of a two-person team.

SCHEDULING

Your schedule for this job should be established right away, and it is crucial that it be followed. If you are working with the circulation sample, for example, it must be collected each day so that a complete record results. The other methods rely on the teamwork of two individuals, so the importance of adhering to the schedule is obvious.

DATA COLLECTION SHEETS

The information you will gather from your sample is listed at the top of the Data Collection Sheet. (Samples of sheet, log, and schedule are presented in Chapter III of the Manual.)

Item Number

This is a consecutive number beginning with "1" and ending with the last item you collect, to identify each line of data. Note: each method sample to be collected should have only one run of consecutive numbers; each data collector picks up where the previous data collection shift ended.

Call Number

This information will be used to analyze the data by subject of the material.

Publication Year

This is collected so the item's recency of use can be compared with its age.

Last Circulation Date

The LCD is the variable that is used to judge the amount of use an item receives.

Optional

The "Optional" field can be used to record unique information or to keep track of a variable which is considered important by the project supervisor.

RECORDING THE DATA

Since the information you record will probably be analyzed by someone else, it is important that it be written down in a legible and consistent manner. Please refer to the Chart: Location of Data Elements, following, as you read through this section.

[INSERT "LOCATION OF DATA ELEMENTS" HERE]

Call Number

The first two fields of the call number are the only ones needed for analyzing the data. The entire call number should be recorded, though, because you may have to find the publication year through the card catalog, if it is not on the circulation card or in the volume itself. The data collection sheets designate a place in the column for the first two fields, and a place for the remainder of the call number. Some call numbers are preceded or followed by a special code or designation, such as "Rare Book," "Oversize," or "+." These should be recorded with the remainder of the call number in the right half of the Call Number column on the Data Collection Sheet to help you find the appropriate catalog record if needed. If your library uses the Library of Congress classification system, the first two fields are:

- The single-letter or double-letter code in the first line (e.g., M 41 or PN 6884).
- The numbers on the same line or on the next line of the call number, which contains numbers only (e.g., M 41, PN 6884 or HF 691).

The placement of these fields on the circulation card, book or volume is seldom standard, so some care is required here. The remainder of the call number should also be noted, as mentioned above.

LOCATION OF DATA ELEMENTS

LOCATION OF DATA ELEMENTS	CALL NUMBER FIRST FIELD: LC, Dewey or other main class number and subclass designation. SECOND FIELD: Cutter number; year (if any); volume or copy number (if any); special designation (if any)	PUBLICATION DATE Four-digit number, indicates either o Date of publication o Date of most recent edition o Copyright date or Accession date	LAST CIRCULATION DATE Six-digit number, indicates: Month (2) Day (2) Year (2) When item last circulated
CIRCULATION SAMPLE	1. Circulation card at daily circulation statistics collection 2. Circulation card at time of checkout 3. In circulation file	1. Part of call number 2. Card catalog entry 3. Shelflist entry	1. Circulation card (LCD = date prior to current checkout date) 2. Date Due Slip (LCD = last date stamped prior to current due date 3. Other prior circulation record
STACK SAMPLE	1. Spine of book on shelf 2. Inside cover of book	1. Part of call number (spine of book) 2. Verso of title page	1. Date Due Slip (LCD = last date stamped) 2. Circulation card in book (LCD = last date recorded)
SHELFLIST SAMPLE	1. Shelflist card	1. Shelflist card 2. Part of call number (spine of book) 3. Verso of title page	1. Date Due Slip (LCD = last date stamped) 2. Circulation Card in book (LCD = last date recorded) 3. Other circulation record

If your collection uses the Dewey Decimal classification scheme, the two major fields are:

- The three numbers on the first line before the decimal point (e.g., 027.7 or 993.3782).
- The numbers after the decimal point, usually on the same line (e.g., 027.7 or 993.3782).

In some cases, there are no numbers after the decimal point. If so, an "0" should be recorded for that field.

If your collection is classified in another system, the project supervisor will identify the appropriate elements. The remainder of the call number, including special designations, should be recorded in the second part of the Call Number column. Occasionally the first two fields will be split to fit on two lines if its length is excessive for one line (e.g., 331.89281 or 331). Ask the project supervisor for an explanation if this occurs and is difficult to resolve.

Only the two main call number fields should be recorded in the left half of the column; the rest of the call number should be noted in the right part.

Publication Year

The four-digit year of publication is the item required here. It is sometimes incorporated as part of the call number, but other recordings of it are more reliable. Sometimes the publication year will not be observable on the sample item; the priority system for finding a substitute publication year is:

- First: Year of publication
- Second: Year of most recent edition of the item
- Third: Copyright year
- Fourth: Year of purchase by the library

If no date of publication is available, record a "0" in the column for that item.

Last Circulation Date

In the circulation sample, the Last Circulation Date (LCD) is the most recent date prior to the current circulation. In the stack or shelflist sample, the LCD is the last date indicated on the circulation card or date due slip. The LCD should be recorded in 6 digits, with slashes between each 2 numbers, in the order of month, day, and year, respectively. You may have to translate your library's date record into this six-digit number, for example:

May 10, 1985	=	05/10/85
1/3/75	=	01/03/75
05 06 8	=	05/06/78
77 3 5	=	03/05/77

Some ambiguities may arise regarding the meaning of a date like 05 06 8; these can usually be resolved by checking with the project supervisor, who will be able to differentiate between the items checked out in, say, 1968 from those taken out in 1978.

RECOMMENDED COLLECTION ROUTINES

The choice of routines for collecting the data will be determined by the project supervisor and other staff, based on their knowledge of local circumstances. From the experiences of the three pilot libraries, however, the following basic routines are recommended, with the understanding that they may be modified as needed.

Circulation Sample

This method is considered the easiest to implement because it can usually be done in conjunction with other circulation desk routines like the checkout process or the daily statistics compilation. This sample must be taken on a daily basis since it is to be a sample of all the items circulated during a given period of time. If your project supervisor decides to collect the data as the items are being checked out, you will perform these routines as part of the regular checkout procedure each time a patron wants to remove a book for outside use. Your job as data collector for the circulation sample consists of the following:

1) Either at the time of checkout or when circulation statistics are recorded, number the entries on the data collection sheet, beginning with "1" on the first day of data collection and continuing consecutively.

2) Identify on the charge-out record as many of the data items as possible--these are usually the call number fields and the last circulation date (LCD).

3) Note that the LCD is not the current checkout date, but the most recent date of the material's circulation before this.

4) Record the data in the appropriate columns.

5) After the day's circulation has been entered, or after a batch of it has accumulated, take the data collection sheets to the card catalog and look up the call numbers to find each item's publication year, if it was not available from the circulation record.

It is not necessary to enter the items in call number order when noting them on the Data Collection Sheets. The analysis will total them by classification.

Stack Sample

The experiences of the pilot libraries showed that the task of collecting the stack sample was made much easier when conducted by teams of two people; the first identifies the items to be sampled, and the second records the information. Modifications of this basic procedure evolved at each location, and all were appropriate and efficient. The project supervisor and other members of the study's Advisory Group will have decided the sample size by the time data collection is underway. This will affect the collecting routines of the stack sample.

1) In the "Item" column of the data collection sheet, begin numbering consecutively for each line of data collected.
2) Depending upon the sample size, the project supervisor will identify a random number between 1 and 100 (since the smallest sample recommended is 1%). For example, if the sample size is 4%, a number should be chosen randomly between 1 and 25; if it is 2% it should be a number between 1 and 50, and so on. Please refer to the Sample Interval Chart which follows if this is unclear.
3) After identifying this "seed" number, go to the beginning of the collection in the stacks and identify the book on the first shelf which corresponds to that number.
4) Flag this volume by marking it with a sticker or turning it on its foredge (or any other suitable way).
5) Continue from the "seed" book and move at the interval of intervals which will yield the right percentage of the sample. Refer to the Sample Interval Chart which follows to determine the pattern for selecting items to reach the selected sample size.
An example is appropriate here:

   If the sample size is defined at 3%, the first volume identified to start the collection would be chosen by actually writing all the numbers from 1 to 34 on as many slips of paper and choosing one at random. The chosen number (say, 14) labels the 14th volume at the beginning of the stacks as the "seed" volume. Then, counting the book next to it as "1," you would count to 33, and flag that volume; count to 33 again and flag that volume; and then count to 34 and flag that, so that each subpopulation of 100 in the collection will have 3 items sampled. The pattern continues in the same way, throughout all the volumes in the stacks.

6) After flagging the sample items in a range (or whatever section is appropriate), go back to the flagged items and record the data from the volumes, as indicated previously.

7) Continue through the stacks following the same procedures.

As noted above, teams of two people accomplish this task faster and more easily than one person. The choice of routines is up to you as team members: one person can count and flag while the other follows and records; or both can count and flag, then return to the range to find the data and record it. The routine can be flexible, but consistency and accuracy are very important.

Shelflist Sample

Although the shelflist sample requires approximately twice as much time as the stack sample, a library staff may decide that the procedures are more appropriate for their library and choose to invest the necessary time.

Those assigned to shelflist sample data collection should read the information on stack sample data collection. Of special importance is the explanation of systematic random intervals for sampling. The same routines apply in the shelflist sample. Working in teams of two is encouraged here, too: at the shelflist itself, one team can do the tasks of flagging and recording, and in checking the books in the stacks for the Last Circulation Date another team can search for and record the information.

1) Begin by numbering the "Item" column consecutively, to record the number of data lines collected.

2) Using the same procedure described in the section on Stack Sample collection, go to the shelflist and identify the first or "seed" card to be sampled.

3) Using the same procedures described in the Stack Sample collection, identify and flag the remaining sample items in the shelflist drawer.

4) Record the necessary information from each shelflist card to be sampled in the drawer.

5) Counting the card following the last one sampled in the first shelflist drawer as "1," continue counting into the next drawer until you reach the number of the next interval.

6) Continue with the same procedures through the shelflist.

[INSERT "SAMPLE INTERVALS FOR STACK AND SHELFLIST SAMPLES" HERE]

SAMPLE INTERVALS FOR STACK AND SHELFLIST SAMPLES

FOR:	CHOOSE:	FLAG:
Sample Size (7%)	Beginning Item Between 1 and	Items at Intervals after "Seed" Item
1	100	100 (constant interval)
2	50	50 (constant interval)
3	33	33, 33, 34
4	25	25 (constant interval)
5	20	17, 26, 17, 17, 16, 17
6	17	14, 14, 15, 14, 14, 14, 15
7	14	12, 13, 12, 13, 12, 13, 12, 13
8	12	9, 9, 9, 9, 9, 9, 9, 9, 10, 9
9	11	10 (constant interval)
10	10	

ANALYSES

Once the data is collected, it needs to be tabulated in ways that will permit its use. The following are step-by-step procedures for five basic tabulations or analyses and general instructions for graphing the data. These five analyses should be performed on each entire sample which is collected as well as on each subject classification interest. The next chapter shows how the results of these analyses might be used to help make a variety of library policy decisions.

Before beginning the analysis, the project supervisor should ensure that sufficient copies of the analysis sheets have been produced. The sheets should be labeled for each sample being analyzed (circulation, stack, or shelflist) and for each subject to be analyzed as defined by local need or interest (e.g., general collection, art, chemistry, political science) in the spaces at the top of each analysis sheet.

Data analyzers can be selected from the group of data collectors who show an interest in the study's results, and who exhibit patience and the propensity for accuracy.

Analysis 1: Call Number Frequencies

This analysis reveals the number of items sampled in each call number designation. In the circulation sample, the results indicate the kinds of materials being checked out during the sample time; in the stack and shelflist samples, this indicates the kinds of materials in the general circulatable collection.

1) In the first column (CALL NUMBER CODE) on the analysis sheet, write down in order every code which is to be tabulated. For example, if the library uses Library of Congress codes the values would be A, AC, AE, AG, to VK, VM, Z. If Dewey is used, the codes would be from 000 to 999.

2) Beginning with the first sampled item on the data collection sheet, put a hash mark next to the appropriate call number in the Count column. Continue through the entire sample. If you conducted a stack or shelflist sample, the data may already be in order by call number. In this case it will be quicker to simply count the number of sampled items with a given code and record the number instead of using hash marks.

3) Count the number of marks next to each code and enter the total in the Number column.

4) Add all the numbers in column 3 to determine the total number of sampled items which have a call number code. If all items have a call number code, this total should equal the number of items in the sample.

5) Divide each number in column 3 by the total as obtained in Step 4. Enter the result in column 4 under Percent. If the total of all values in column 4 does not equal 100% an error has been made.

6) Record the percent (column 4) for the current year (first row) in column 5 (cumulative percent). Add the percent of the second row to the cumulative percent of the first row and record this value in the cumulative percent column. Continue adding the percent of the current row to the cumulative percent of the previous row, putting the total in the cumulative percent column of the current row.

Analysis 2: Publication Year Frequencies

This analysis describes the number of volumes in the sample published each year.

1) In the first column (Year) on the analysis sheet which follows write down in order all possible publication years. For example, if no books in the collection are likely to have publication dates prior to 1800, write down all years from 1800 to the current year.

2) Beginning with the first sampled item on the data collection sheet, put a hash mark in the Count column next to the year which matches the publication year. Continue in this way through the entire sample. If no year of publication is listed, place a mark in the "Missing" count column.

3) Count the number of marks next to each year and enter the total in the Number column.

4) Add all the numbers in column 3 to determine the total number of items sampled which have a publication year. This total is usually less than the total number of items in the sample, because of missing information.

Analysis 3: Month of Last Circulation Date

This analysis indicates the number of items in the sample which last circulated during each month of the year.

1) Beginning with the first sampled item on the data collection sheet, put a hash mark next to the month given in the last circulation date. Continue doing this for each item in the entire sample. If no month is listed, put a mark next to the "Missing" designation.

2) Count the number of hash marks next to each code and enter the total in the third column, "Number."

3) Add all the numbers in column 3 to determine the total number of items for which a month of last circulation date was listed.

4) Divide each number in column 3 by the total as obtained in Step 3. Enter the result in column 4 under Percent. If the total of all values in column 4 does not equal 100% and error has been made.

Analysis 4: Years Since Circulation

This analysis indicates the number of sampled items which last circulated in any given year and the cumulative number of items circulating in the last x years. On the Analysis 4 sheet:

1) Beginning with the current year, list the years in column 1. Usually a list of no more than 100 years will suffice. For example, in the pilot study only the years 1980 to 1900 were listed.

2) Enter in column 2 numbers starting at zero and ending with the last line of the table. For example, the current year (first line) is zero, one year ago is 1, two years ago is 2 and so on.

3) Beginning with the first record in the sample, put a hash mark next to the year which matches the year of the last circulation date. If no last circulation date is available, put a mark next to the year which matches the publication year. If neither is listed, make a mark in the "Missing" section.

4) For each year, total up the marks and record the total in the Count column.

5) Add all the values in the Count column and record the total. This is the total number of volumes in the sample which have either a last circulation date or a publication year.

6) Divide each number in the Count column by the total obtained in Step 5 and record the result in column 5, Percent. These numbers tell the percent of the sample which last circulated in each year (or were published in that year, if no last circulation date was available).

7) Record the percent (column 5) for the current year (first row) in column 6 (cumulative percent). Add the percent of the second row to the cumulative percent of the first row and record this value in the cumulative percent column. Continue adding the percent of the current row to the cumulative percent of the previous row and putting the total in the cumulative percent column for the current row.

Analysis 5: Percent of Items Never Circulated (Stack or Shelflist Only)

This analysis provides, for each publication year, the percent of items which have never circulated.

1) In the first column (YEAR) on the analysis sheet, record in order all publication years of interest. In most cases using only the last 20 or 30 years will be sufficient. For example, you might list all years from 1950 to the present year.

2) Beginning with the first sampled item on the data collection sheet check the publication year. If the year is listed on the answer sheet, and if there is no last circulation date, put a hash mark in the Count column. Continue with the remaining data entered.

3) Count the number of marks next to each year and enter the total in the Number column.

4) From the Number column on the Analysis 2 worksheet, record the number of entries for publication year into the total Number column on the Analysis 5 worksheet.

5) For each publication year, divide the value in the Number column by the value in the Total Number column and enter the result in the Percent column.

Computer-Assisted Analysis

The project supervisor and Advisory Group may decide that computer-assisted analysis is preferable to the manual routine. If so, the process should be referred to the computer staff for input and analysis of the data. Program listings of the routines used in the pilot study are included with the Lake Forest case.

ANALYSIS 1: CALL NUMBER FREQUENCIES

SAMPLE_____ SUBJECT_____

1	2	3	4
CALL NUMBER CODE	COUNT	NUMBER	PERCENT

ANALYSIS 2: PUBLICATION YEAR FREQUENCIES

1	2	3	4	5
YEAR	COUNT	NUMBER	PERCENT	CUMULATIVE PERCENT
	TOTAL			
Missing				

ANALYSIS 3: MONTH OF LAST CIRCULATION DATE

1 MONTH	2 COUNT	3 NUMBER	4 PERCENT
01 January			
02 February			
03 March			
04 April			
05 May			
06 June			
07 July			
08 August			
09 September			
10 October			
11 November			
12 December			
TOTAL			
Missing			

ANALYSIS 4: YEARS SINCE CIRCULATION

SAMPLE_____ SUBJECT_____

1 YEAR	2 YEARS SINCE CIRCULATION	3 COUNT	4 NUMBER	5 PERCENT	6 CUMULATIVE PERCENT

TOTAL:

Missing

ANALYSIS 5: PERCENT OF BOOKS NEVER CIRCULATING

SAMPLE_____ SUBJECT_____

YEAR	COUNT	NUMBER	TOTAL NUMBER (Number column from analysis 2)	PERCENT

TOTAL:

Missing

GRAPHS

Almost any of the data from the five analyses may be graphed. The importance of graphs cannot be overstated. The eye can perceive at a glance complex relationships which remain elusive when presented in table form. In addition, several of the applications discussed in the next chapter can be carried out more easily with data in graphic form. Though producing graphs may appear to be a simple task, it is often otherwise. Each graph requires a number of decisions:

- How long each axis should be
- What units should be chosen for the scales
- What symbols or lines should be drawn
- The most efficient titles and labels, and so on.

If several graphs are to be drawn for comparisons, it is important to use similar units for each graph.

Sample Graph

As an example of some of these graphs, the following data obtained from Analysis 4 from a stack sample for a small college library would be graphed in the following way.

INSERT "ANALYSIS 4 SAMPLE RESULTS" AND "SAMPLE GRAPH" HERE

The first step is to decide what information to graph from this data. One of the most useful plots is a comparative view of the cumulative percent versus years since circulation. For example, the third line of the table has a "2" for years since circulation and "29.0%" for cumulative percent. Thus we can say that 29.0% of the volumes in this stack sample circulated in the last two years. The following steps were taken to graph these two measures:

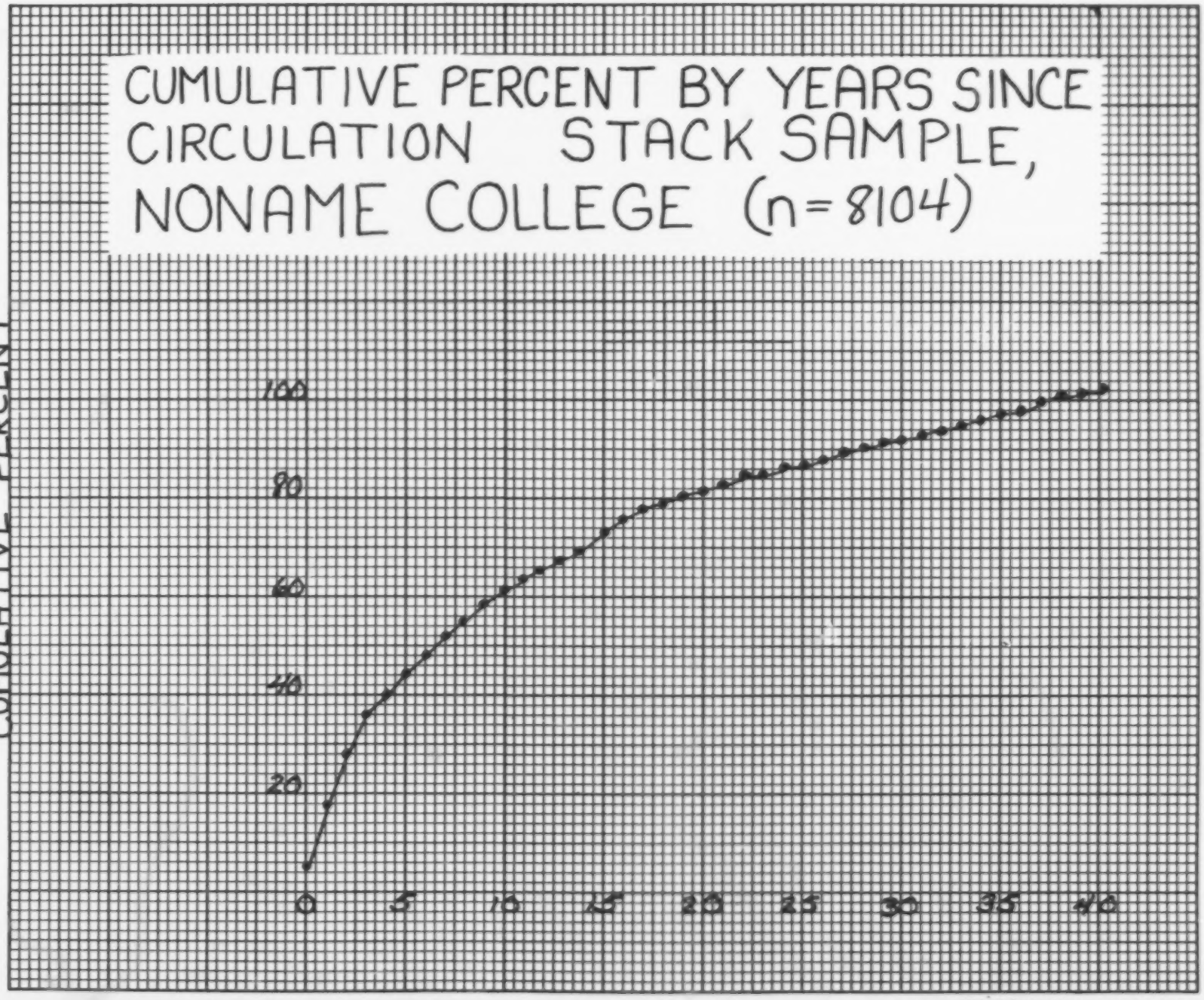
1) Define the variable which should be graphed horizontally (i.e., down). Common practice is to place the years since circulation data horizontally and the "cumulative" percent of data vertically.
2) Select the paper. For this graph, paper scaled at 10 squares to the inch is used.
3) Determine the range of each variable. In this table, "Years Since Circulation" ranges from 0 to 40; cumulative percent ranges from 4.6 to 92.8.
4) Select the ranges for the plot scales. For years since circulation, the range of 0 to 40 is appropriate, because the graphing units cannot be easily divided into units between 4.6 and 92.8. The horizontal range is chosen as 0 to 100%. It is usual practice to plot percentage data using a 0 to 100% range.
5) Select the lengths for the axis. Generally, it is visually satisfying to have the horizontal axis slightly longer than the vertical. It is also desirable to leave a border which allows

for labels. The graph paper used has 100 squares at one axis and 80 at the other. It has been decided that the longer axis requires a range of 0 to 40 using 80 squares for the plotting of the points, leaving 1 inch on either end of the plot for labels. In addition, 40 is easily divisible by 80 which is useful for the next step. For the vertical axis, a range of 0 to 100 must be graphed in 80 squares. Using 50 of these (5 inches) for the plots will leave ample room for titles and labels and will yield a range (i.e., 100) which is easily divided by this number (i.e., 50).

6) Draw the axes and the scales for each axis. The horizontal axis is 80 squares long (8 inches) while the vertical is 50 squares (5 inches). They were drawn on the page (with slightly more room at the top for a title). The horizontal scale has 80 squares for a range of 40. Therefore each square should equal 40/80 = 1/2 unit of measure. The axis is conveniently labeled in units of 5. The vertical axis has 50 squares for a range of 100. Therefore each square should equal 100/50 = 2 units. It is convenient (and visually pleasing) to label the vertical axis in intervals of 20 units.
7) Plot each pair of points, that is, each year since circulation, with its corresponding cumulative percent. The first line of data is 0 years since circulation and 4.6 cumulative percent. Count 0 units to the right of the horizontal scale and up 4.6 units top (2.3 squares) on the vertical and make a dot on the graph. The second pair of points is 1 and 18%. Therefore count across 1 unit (2 squares) on the vertical and place a dot there. Continue plotting each pair of dots in this way.
8) Connect the points in one continuous line.
9) Label the horizontal and vertical axis and title the graph. Make these as explicit and informative as possible. The resulting graph follows.

ANALYSIS 4
SAMPLE RESULTS

YEAR	YEARS SINCE CIRCULATION	COUNT	PERCENT	CUMULATIVE PERCENT
1980	0	404	4.6	4.6
1979	1.	168	13.4	18.0
1978	2.	961	11.0	29.0
1977	3.	574	6.6	35.6
1976	4.	358	4.1	39.7
1975	5.	423	4.8	44.5
1974	6.	293	3.4	47.9
1973	7.	291	3.3	51.2
1972	8.	351	4.0	55.2
1971	9.	293	3.4	58.6
1970	10.	273	3.1	61.7
1969	11.	224	2.6	64.3
1968	12.	216	2.5	66.7
1967	13.	211	2.4	69.2
1966	14.	192	2.2	71.4
1965	15.	161	1.8	73.2
1964	16.	183	2.1	75.3
1963	17.	146	1.7	77.0
1962	18.	131	1.5	78.5
1961	19.	104	1.2	79.7
1960	20.	112	1.3	80.9
1959	21.	86	1.0	81.9
1958	22.	64	.7	82.7
1957	23.	66	.8	83.4
1956	24.	80	.9	84.3
1955	25.	69	.8	85.1
1954	26.	48	.5	85.7
1953	27.	58	.7	86.3
1952	28.	56	.6	87.0
1951	29.	50	.6	87.6
1950	30.	79	.9	88.6
1949	31.	54	.6	89.1
1948	32.	60	.7	89.8
1947	33.	44	.5	90.3
1946	34.	45	.5	90.8
1945	35.	40	.5	91.2
1944	36.	34	.4	91.6
1943	37.	29	.3	92.0
1942	38.	21	.2	92.2
1941	39.	27	.3	92.5
1940	40.	26	.3	92.8



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